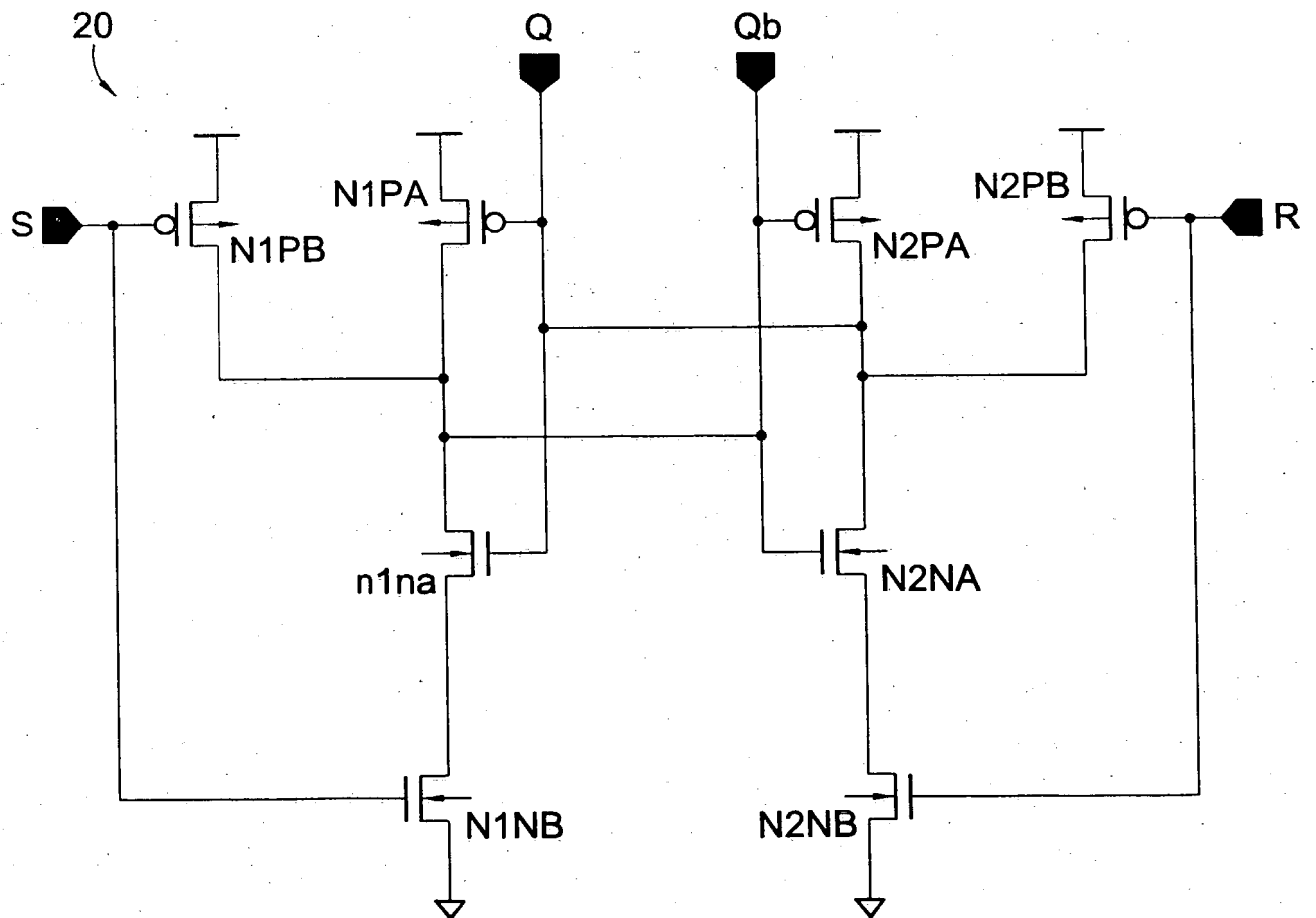
**Fig. 1****Fig. 2**

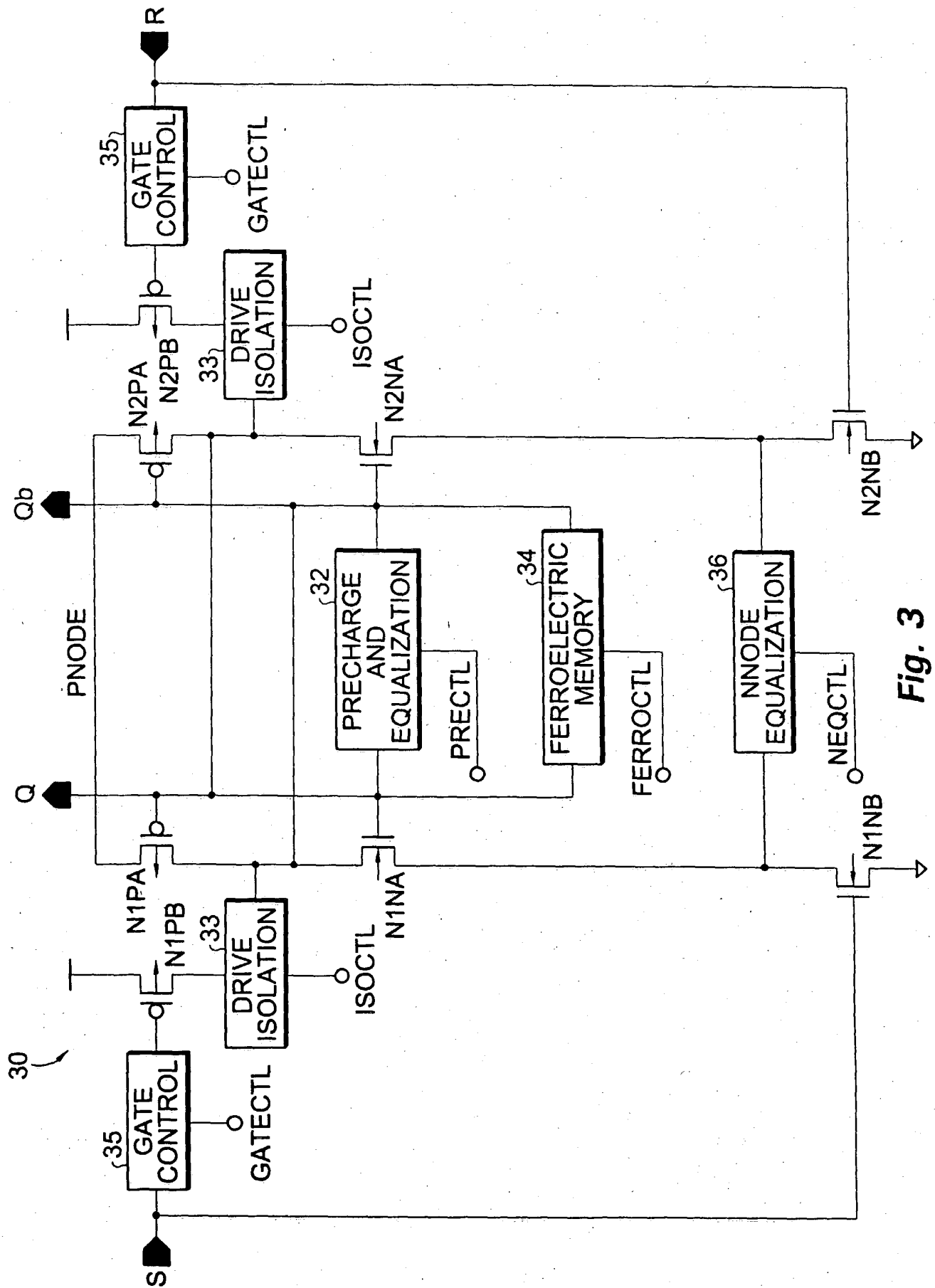
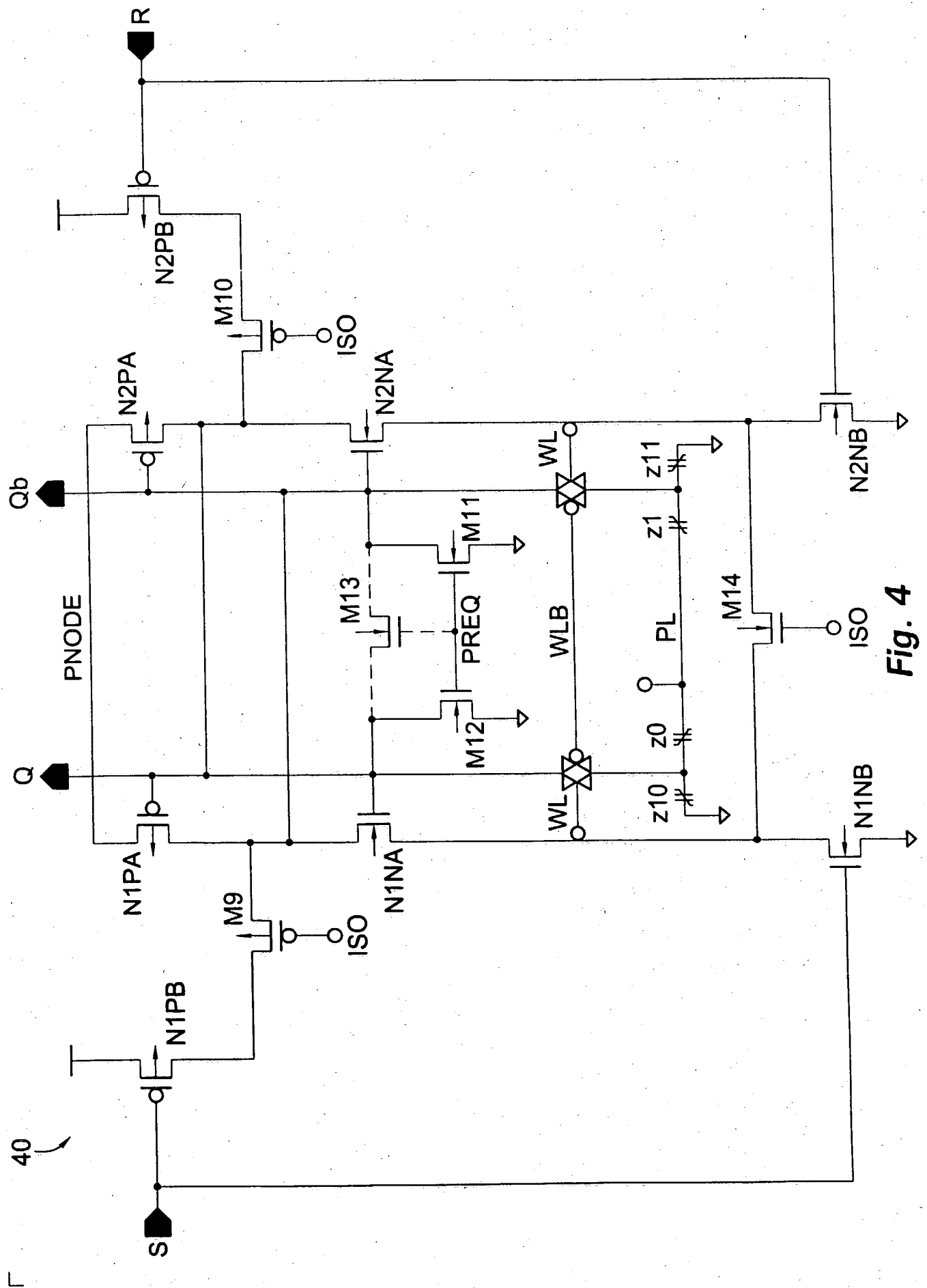


Fig. 3



**Fig. 4**



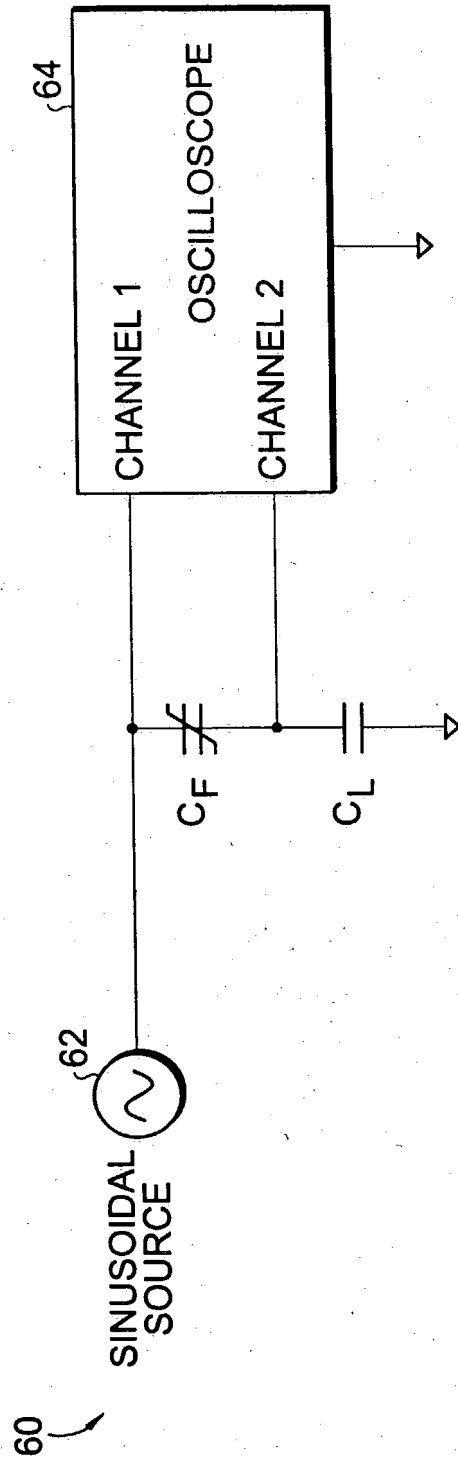
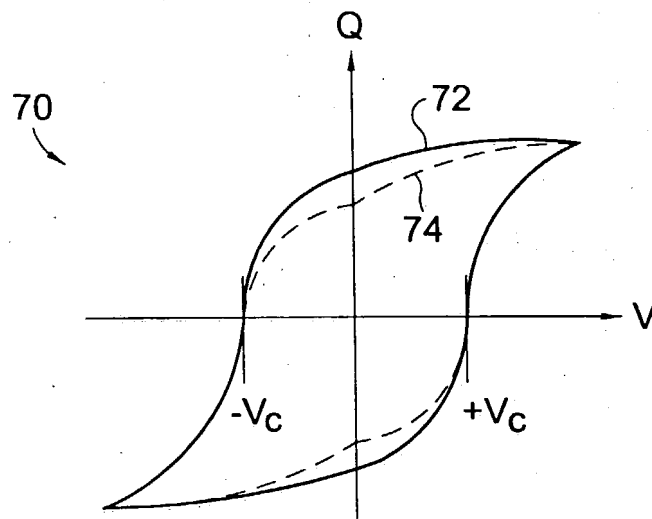
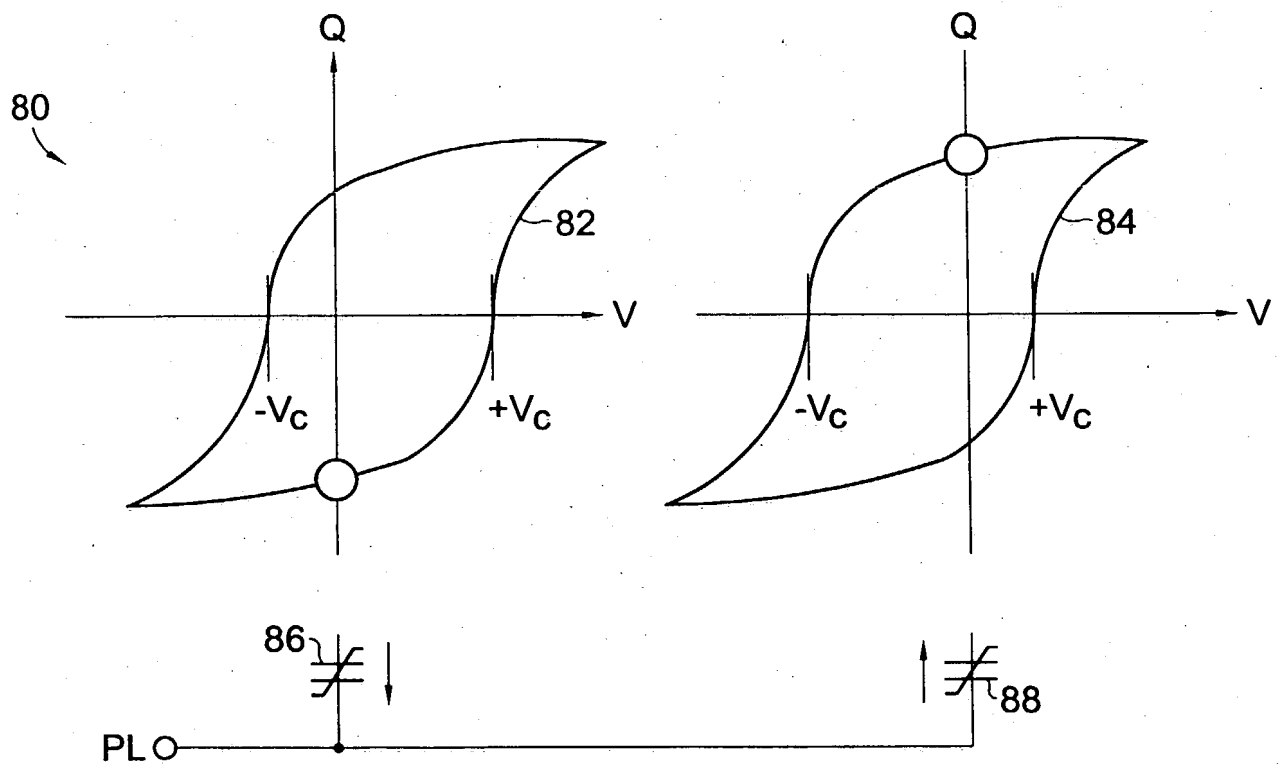
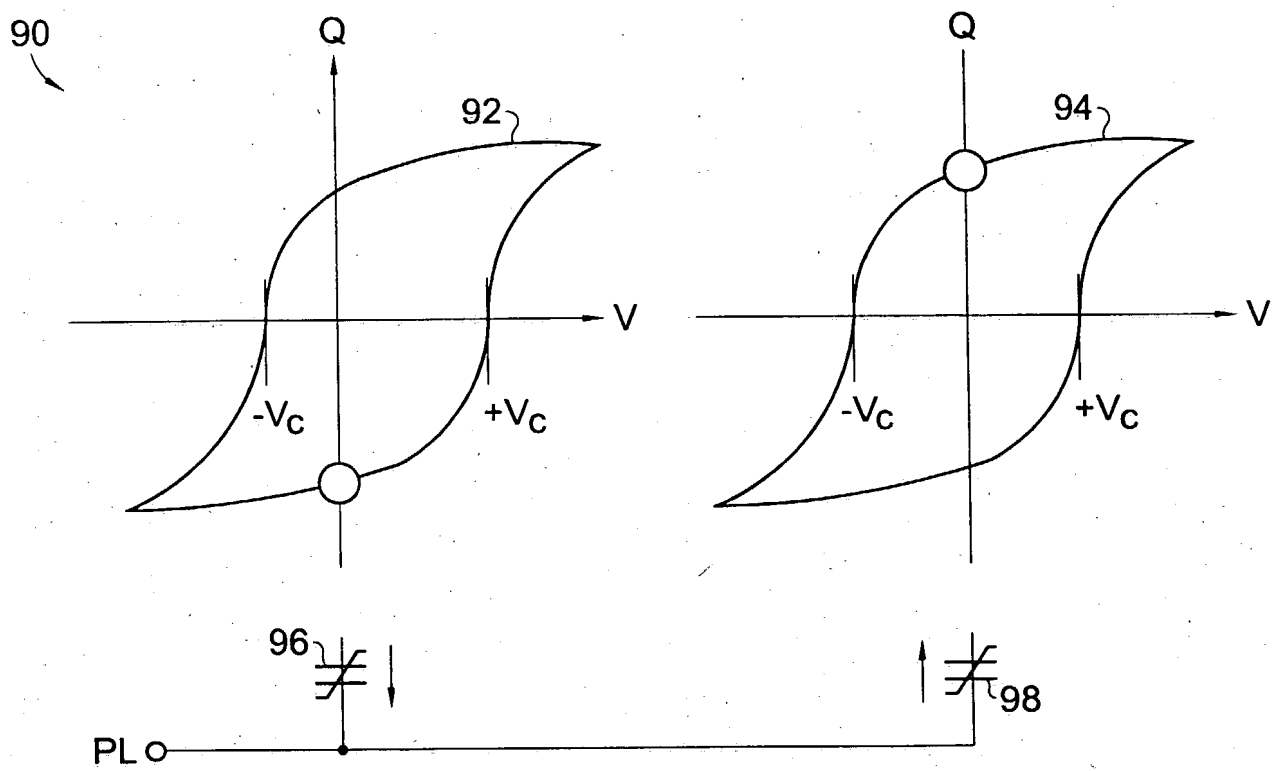


Fig. 6

**Fig. 7****Fig. 8**

**Fig. 9**

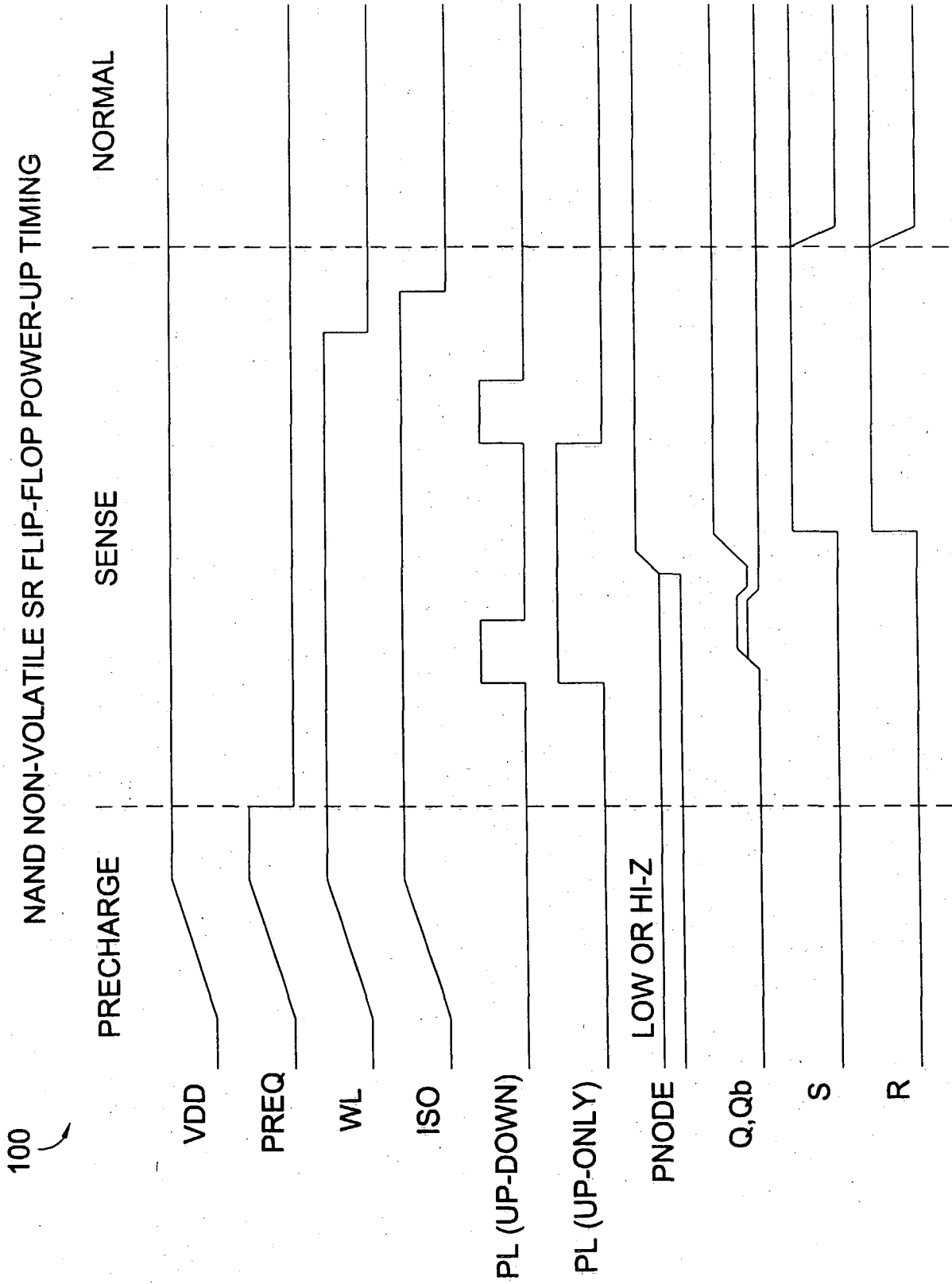


Fig. 10



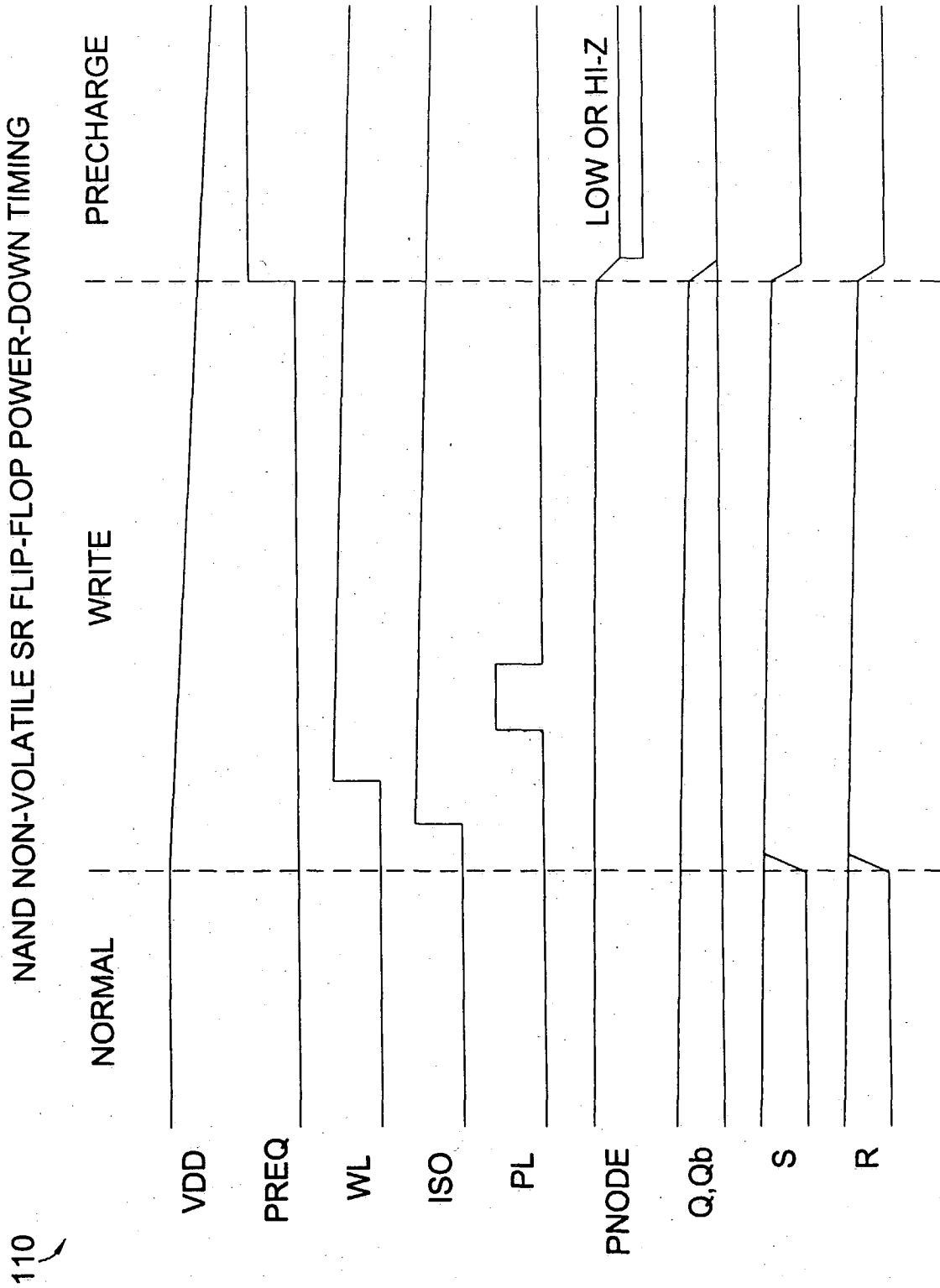


Fig. 11

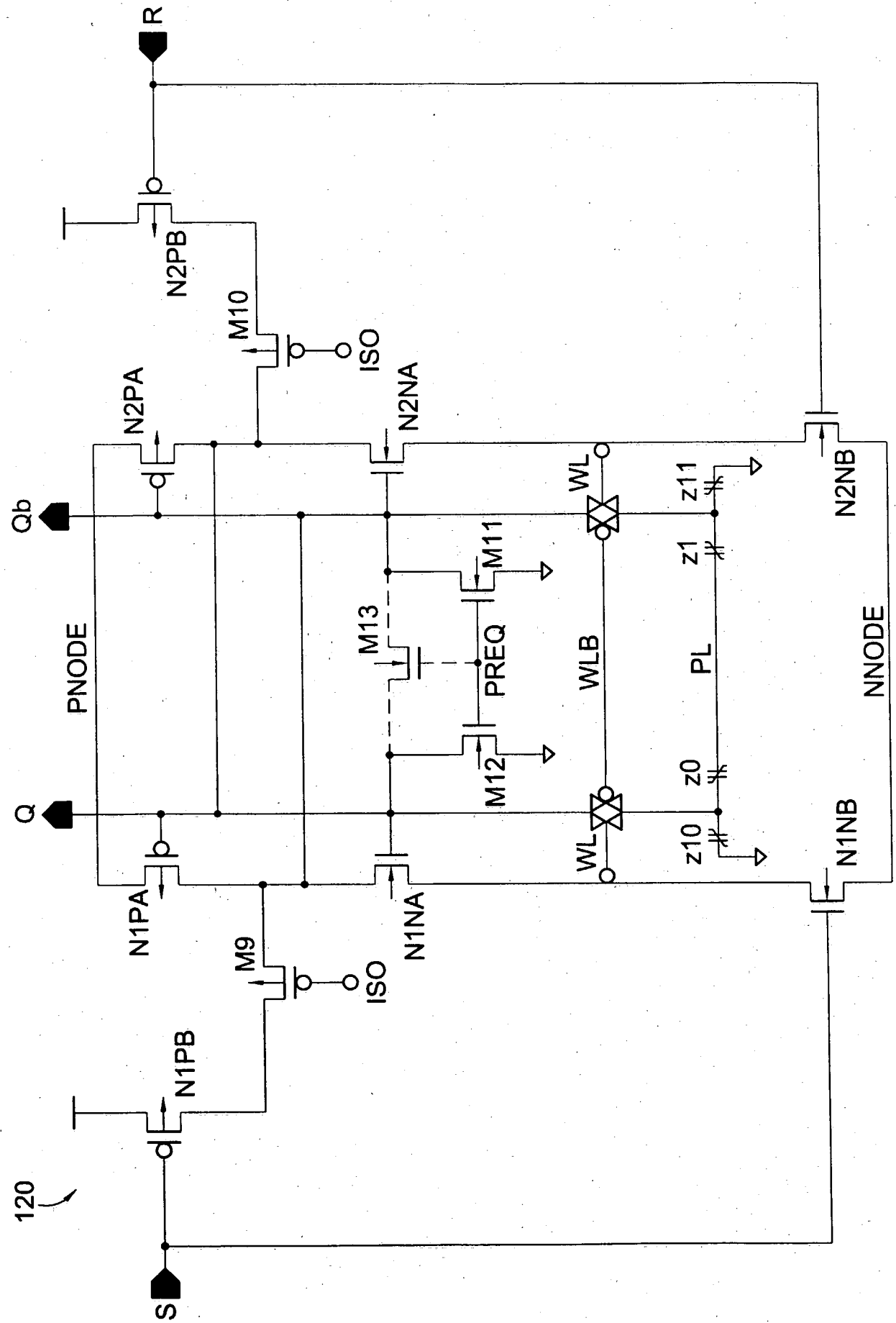


Fig. 12A

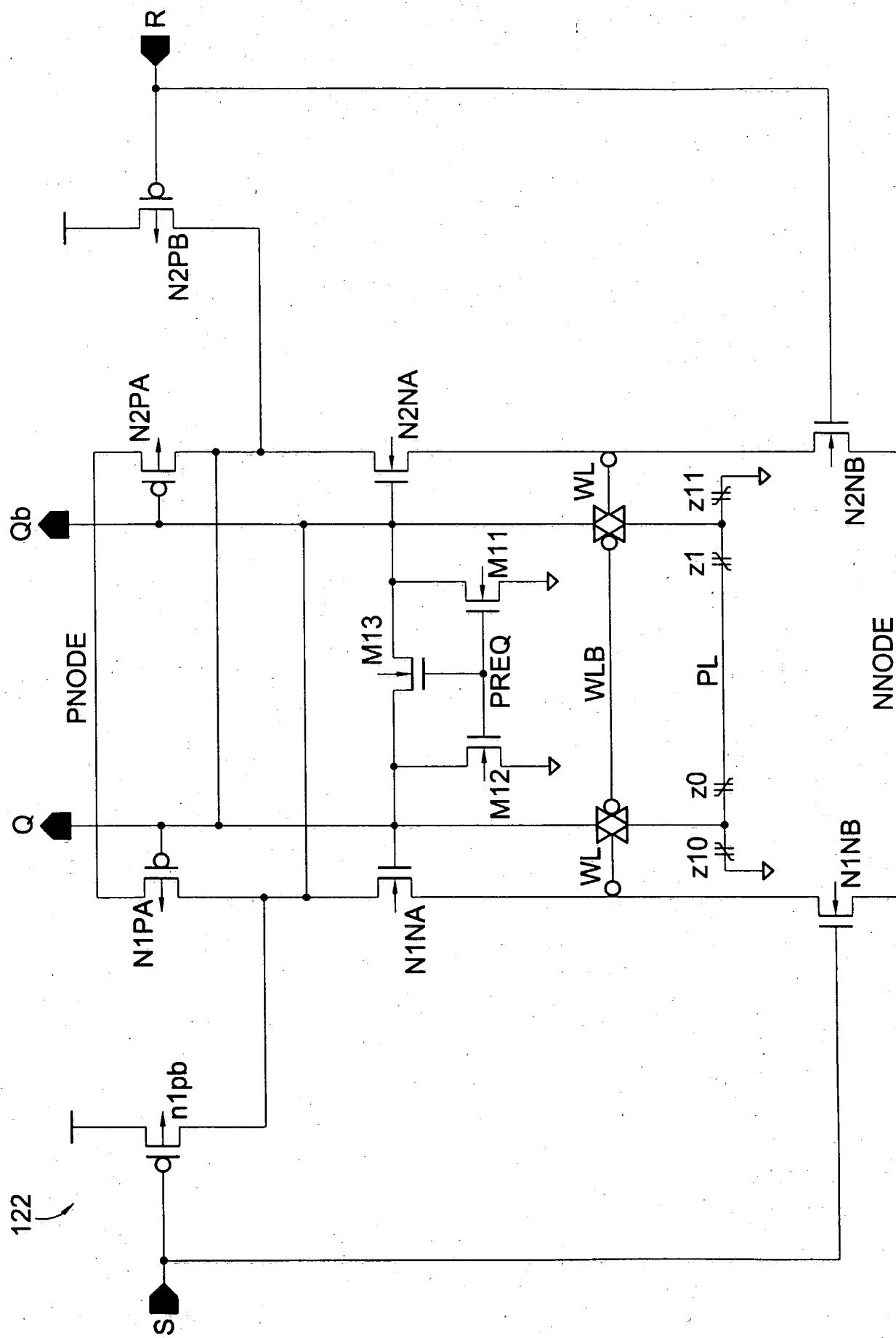


Fig. 12B

# NAND NON-VOLATILE SR FLIP-FLOP POWER-UP TIMING

124

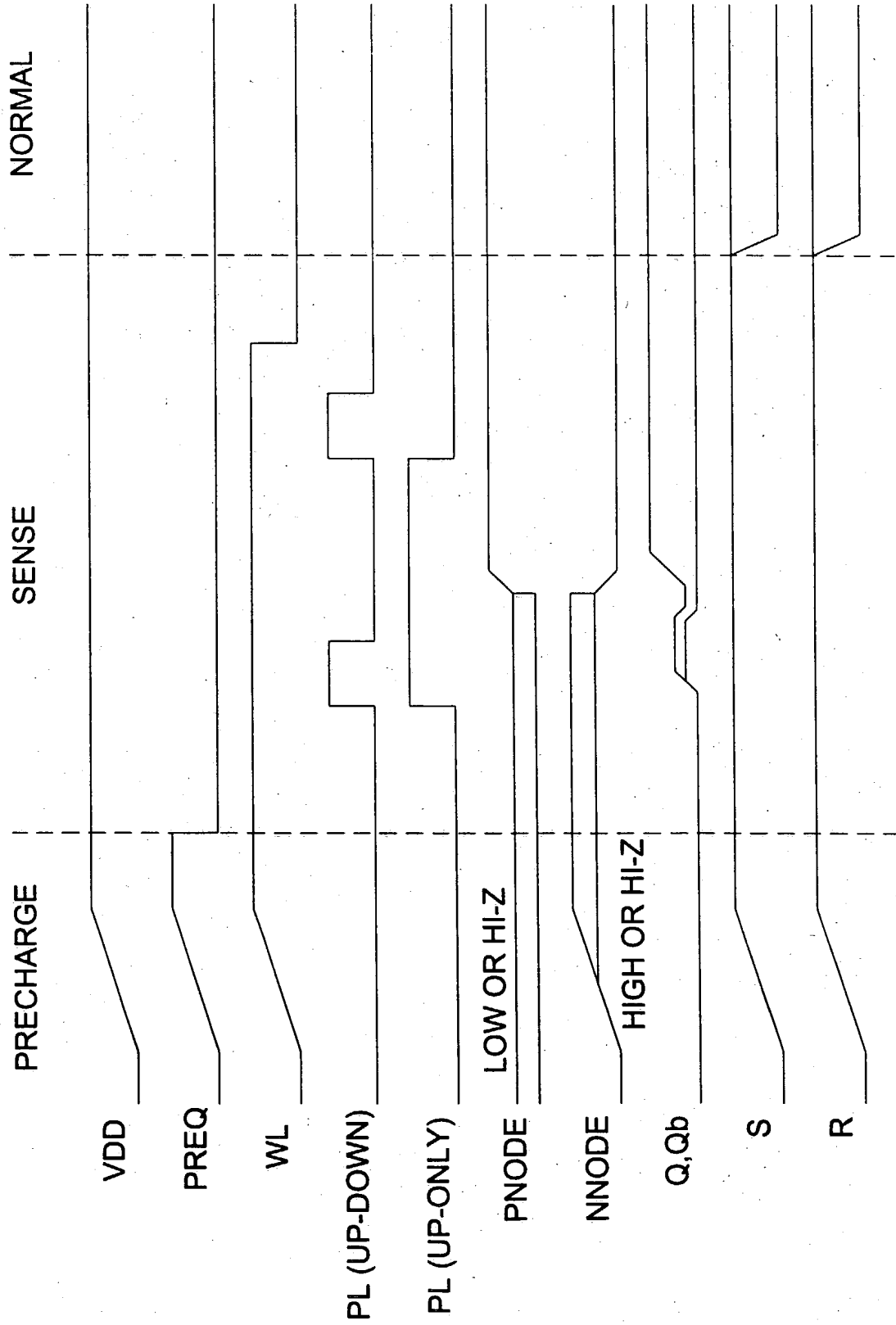
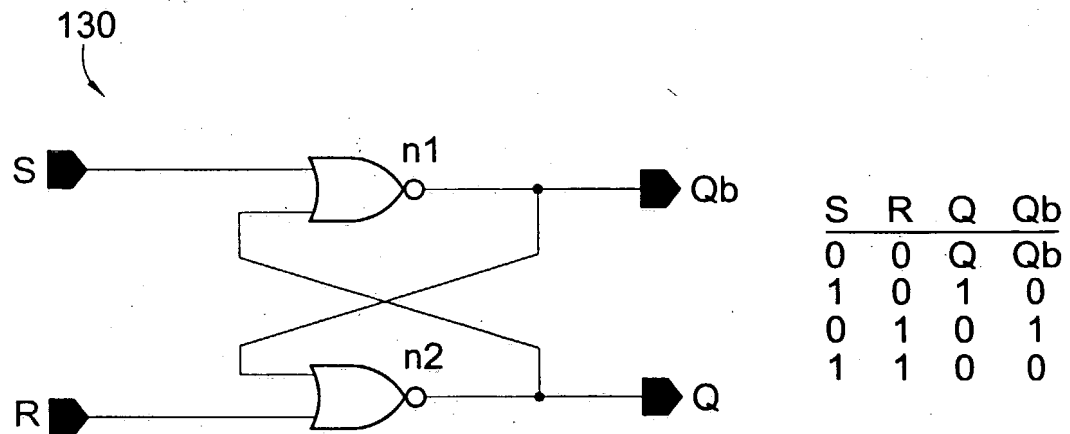
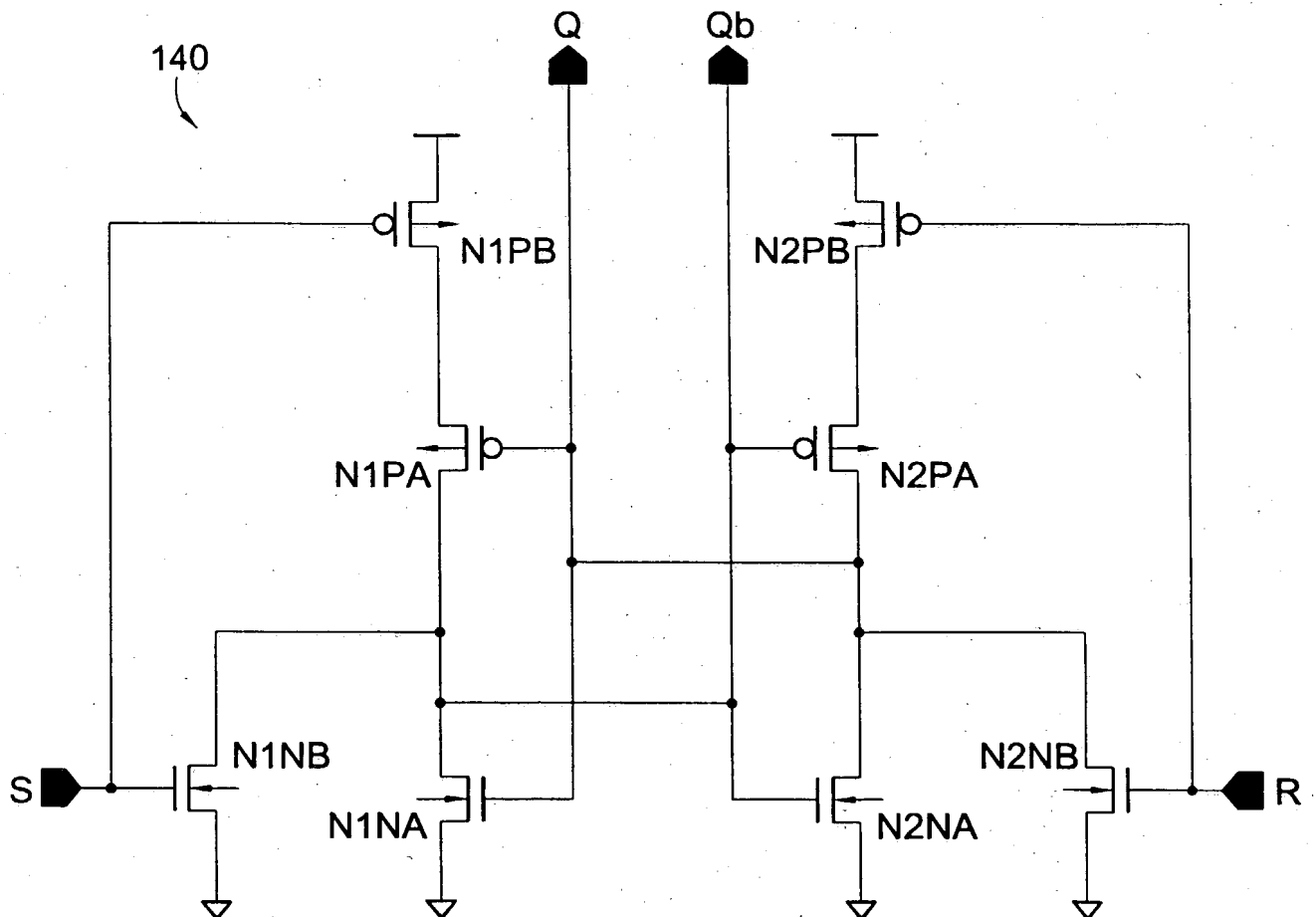


Fig. 12C

**Fig. 13****Fig. 14**

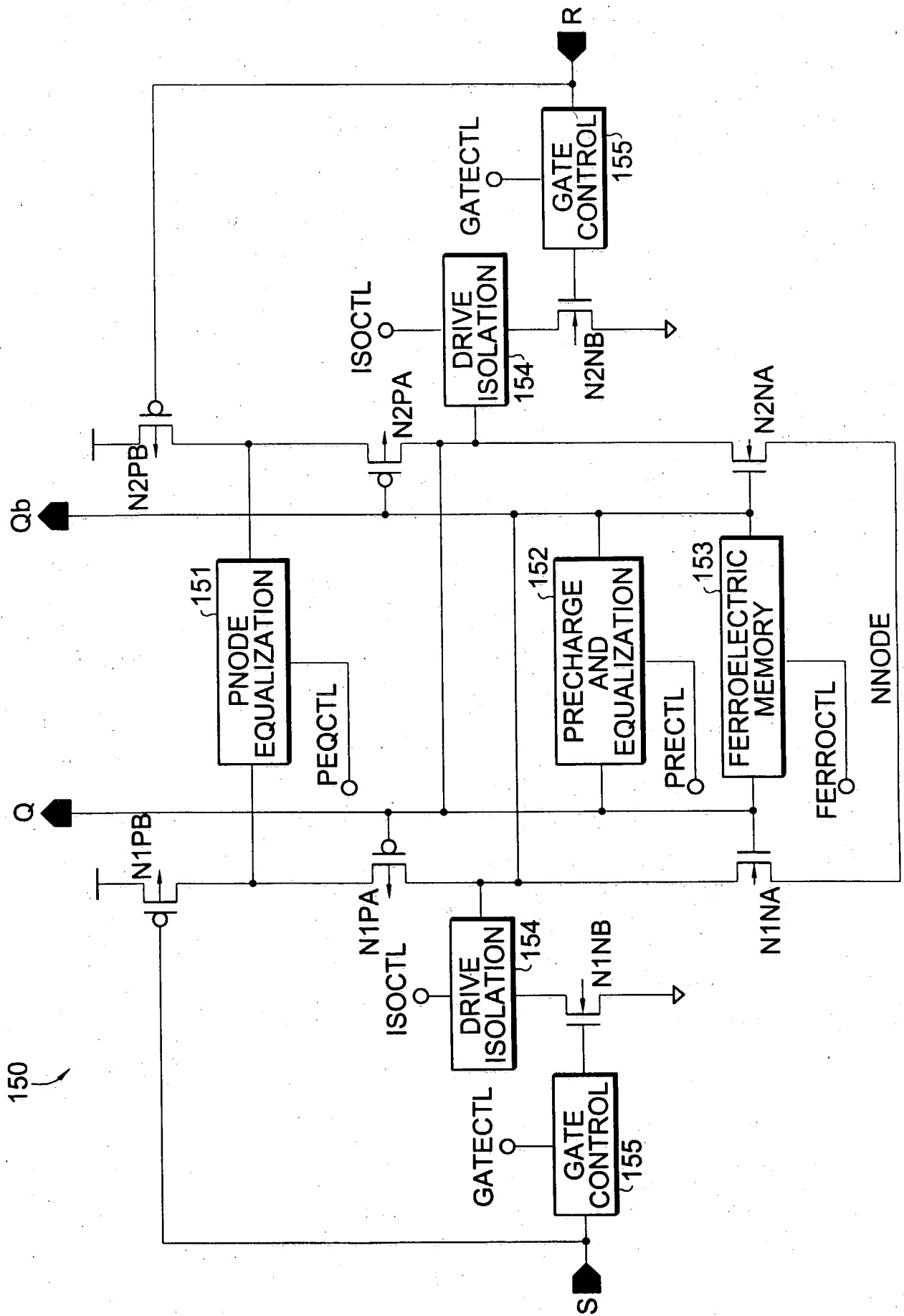


Fig. 15

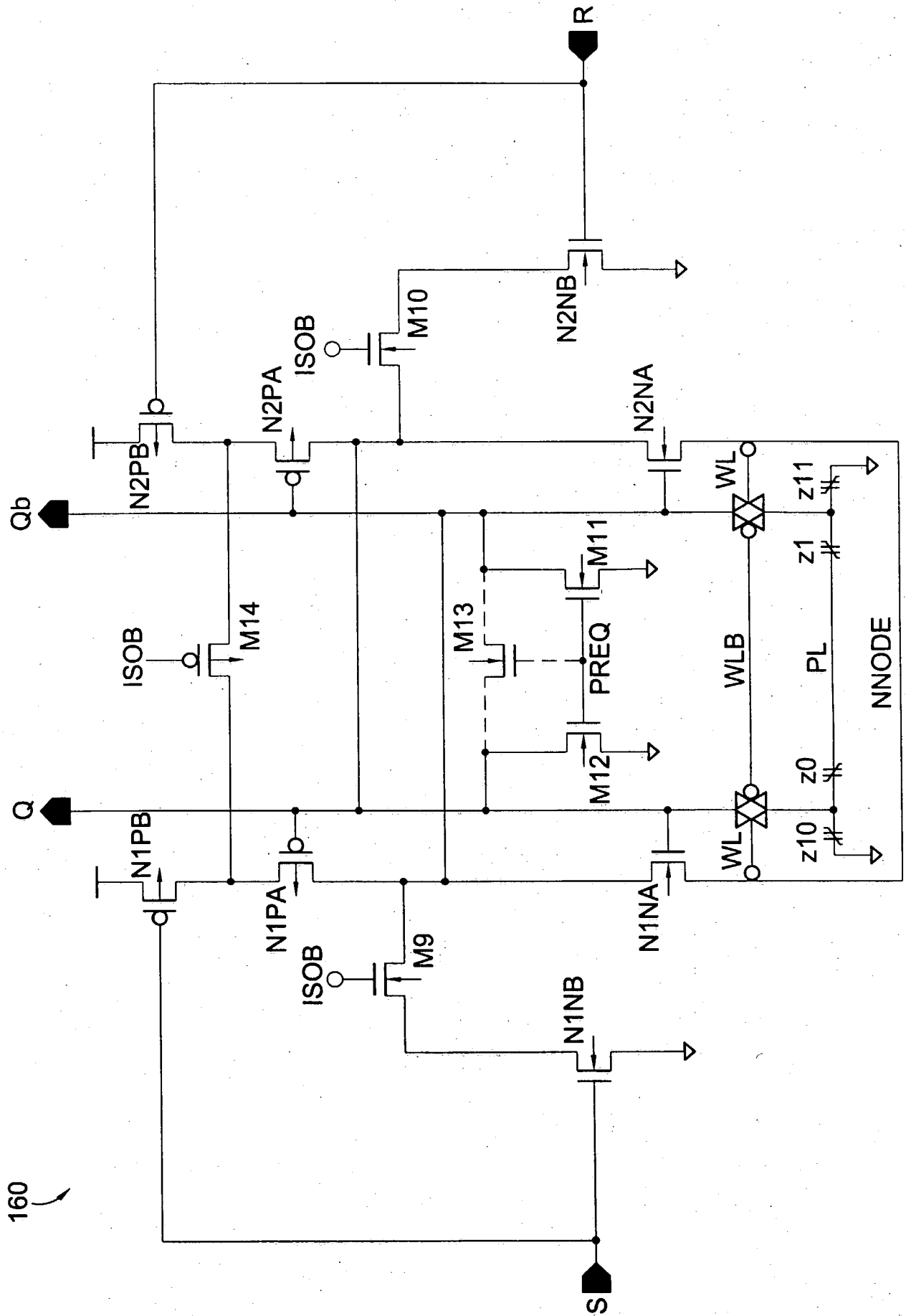
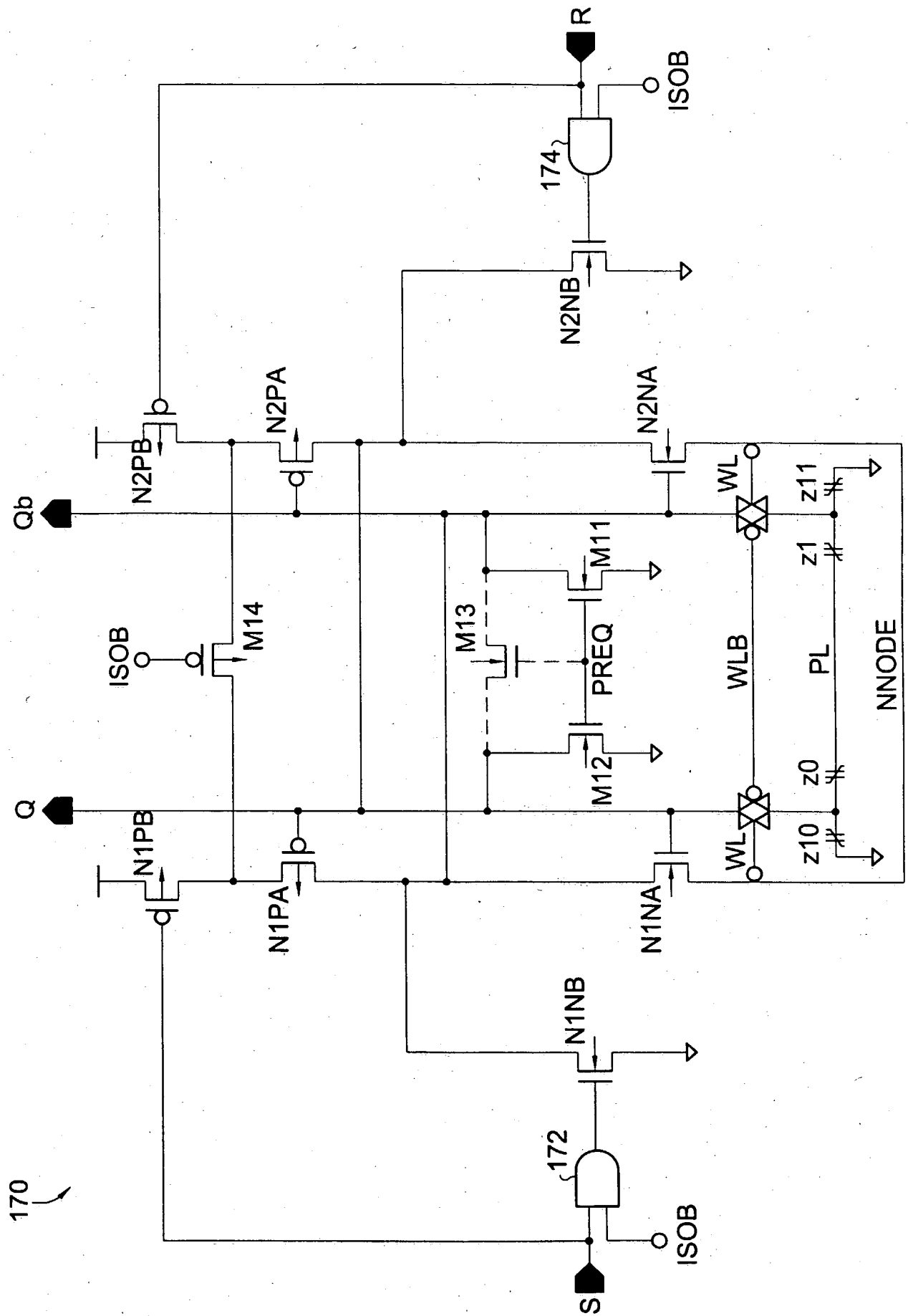


Fig. 16



**Fig. 17**



180 NOR NON-VOLATILE SR FLIP-FLOP POWER-UP TIMING

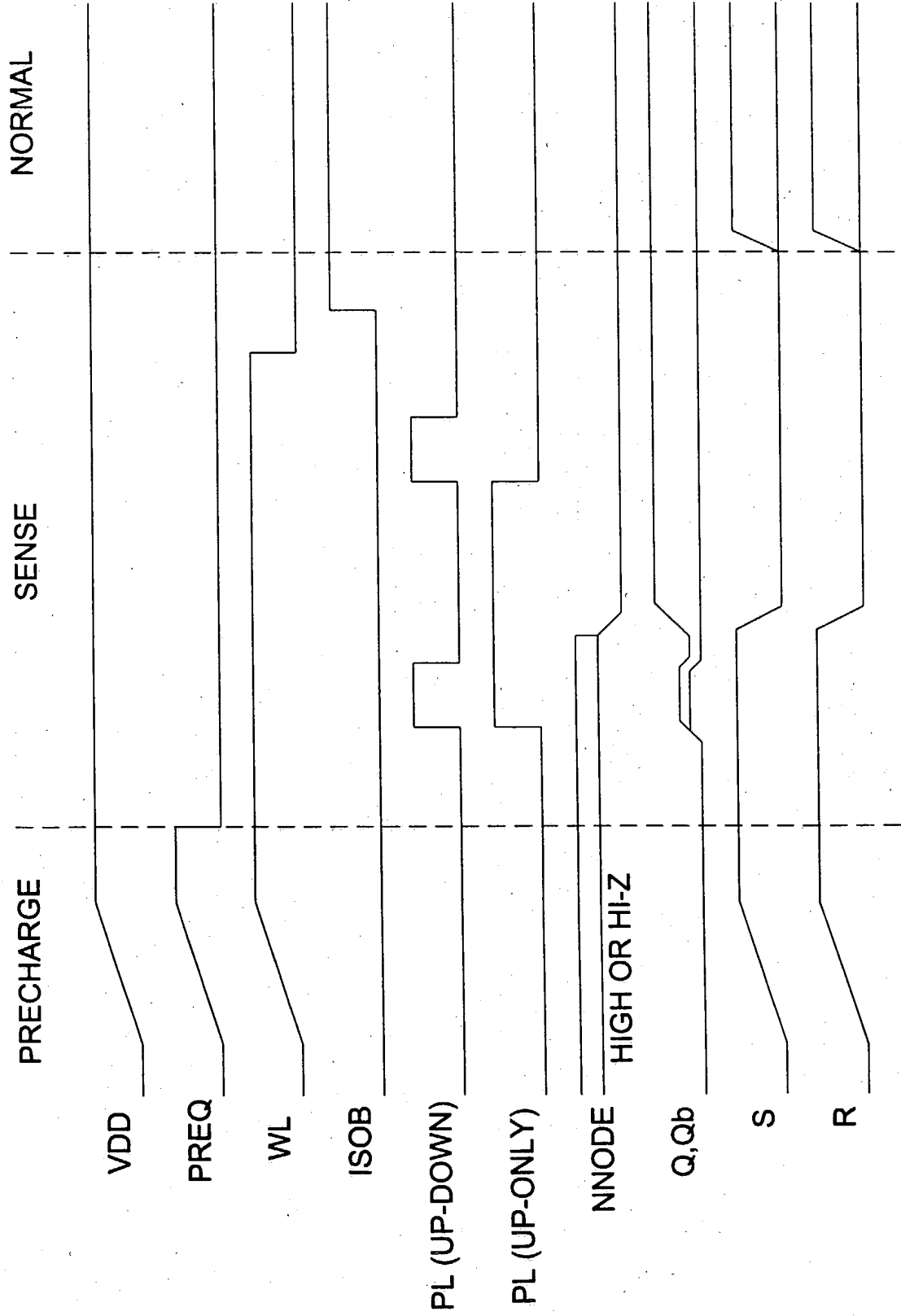


Fig. 18

190

## NOR NON-VOLATILE SR FLIP-FLOP POWER-DOWN TIMING

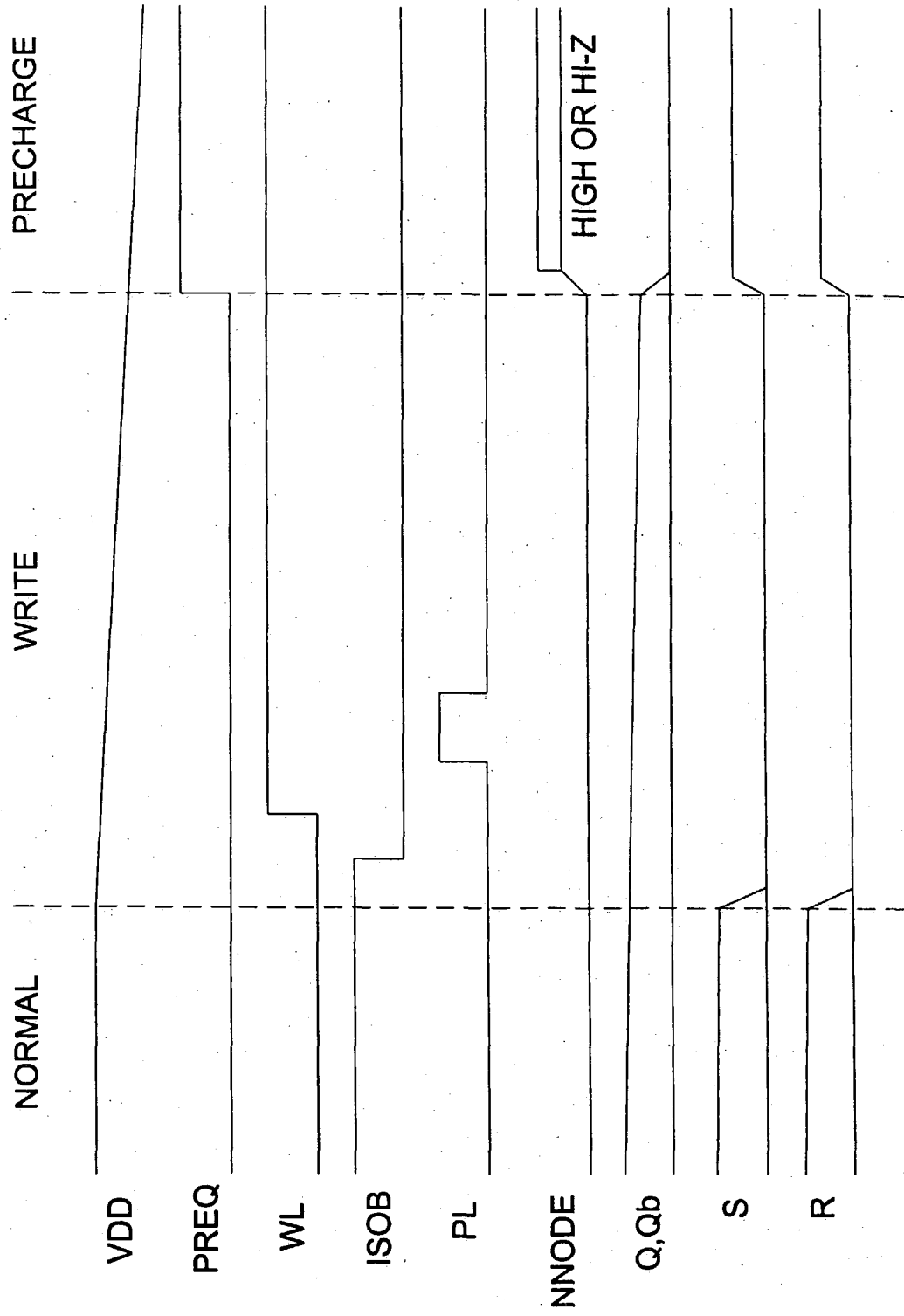


Fig. 19

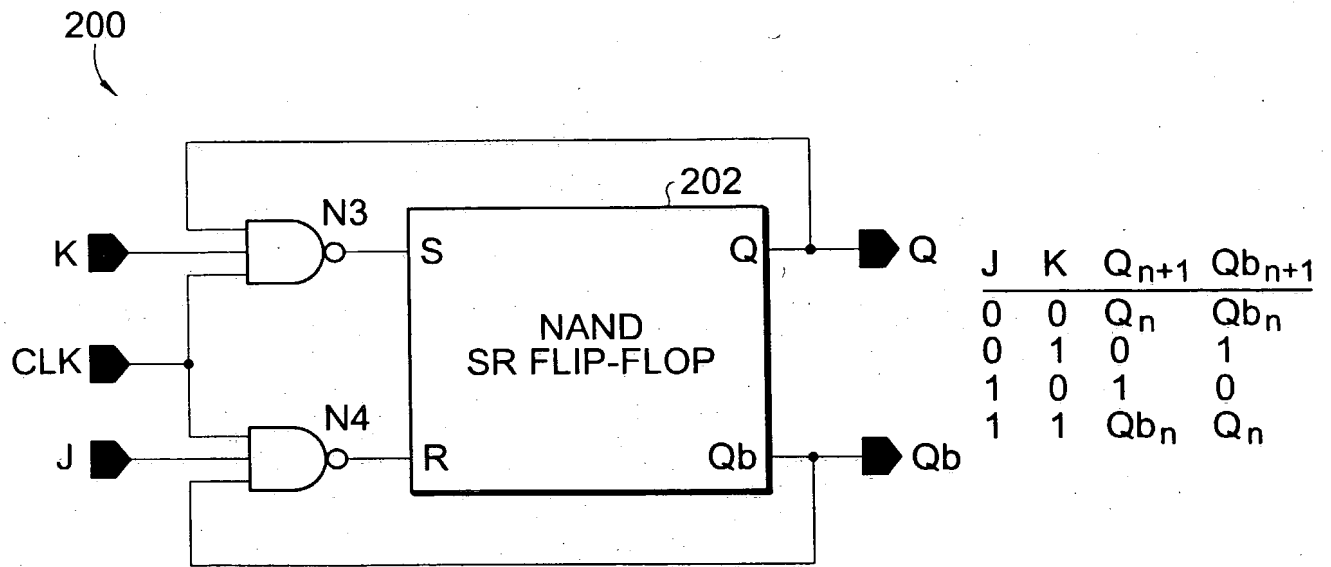


Fig. 20

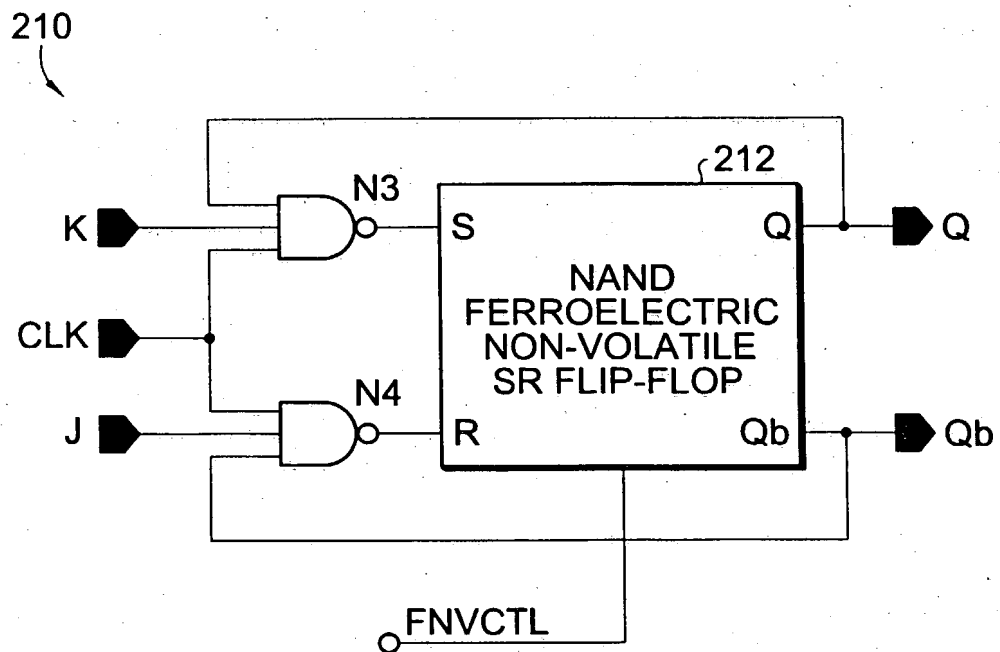


Fig. 21

# NAND NON-VOLATILE JK FLIP-FLOP POWER-UP TIMING

220

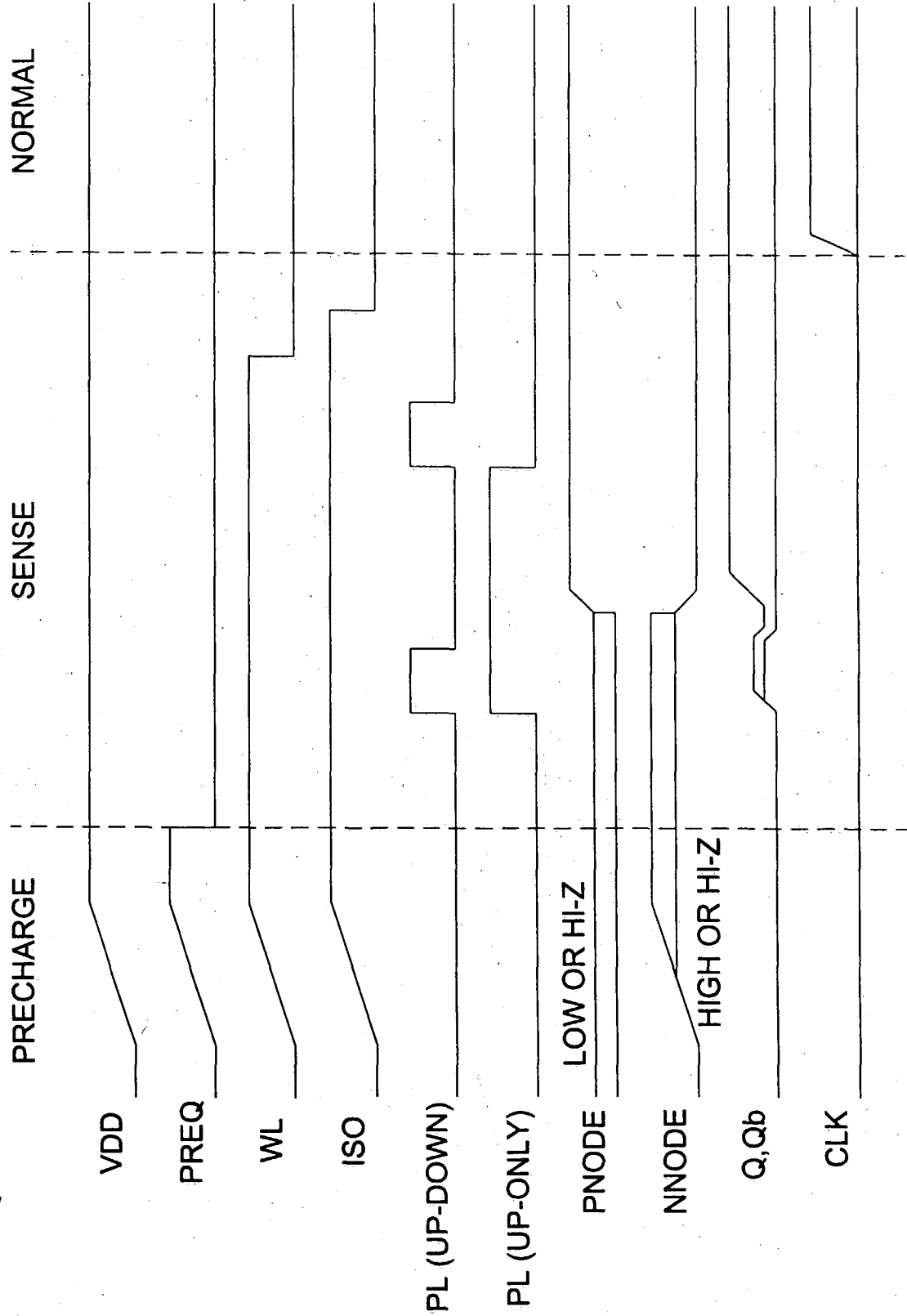


Fig. 22

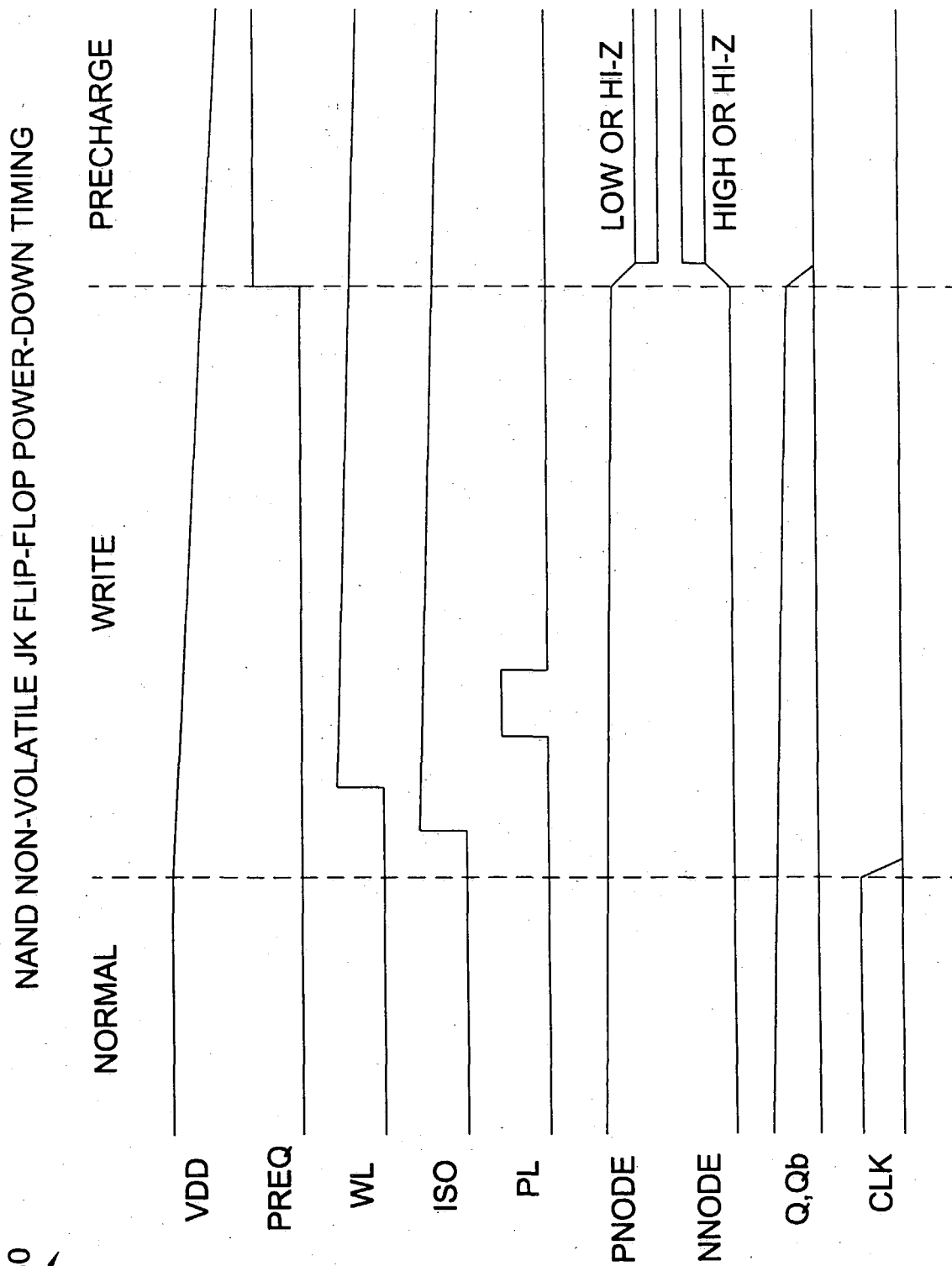
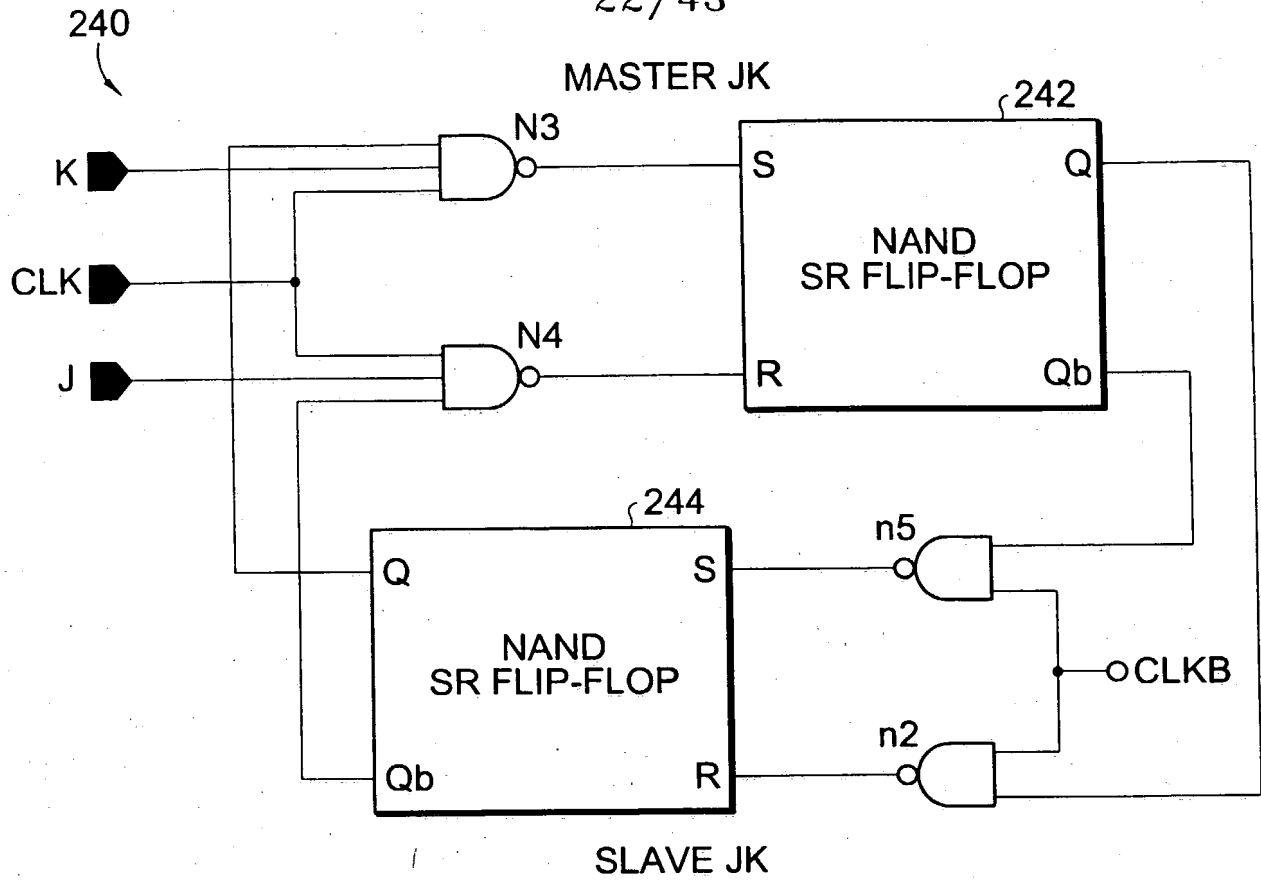
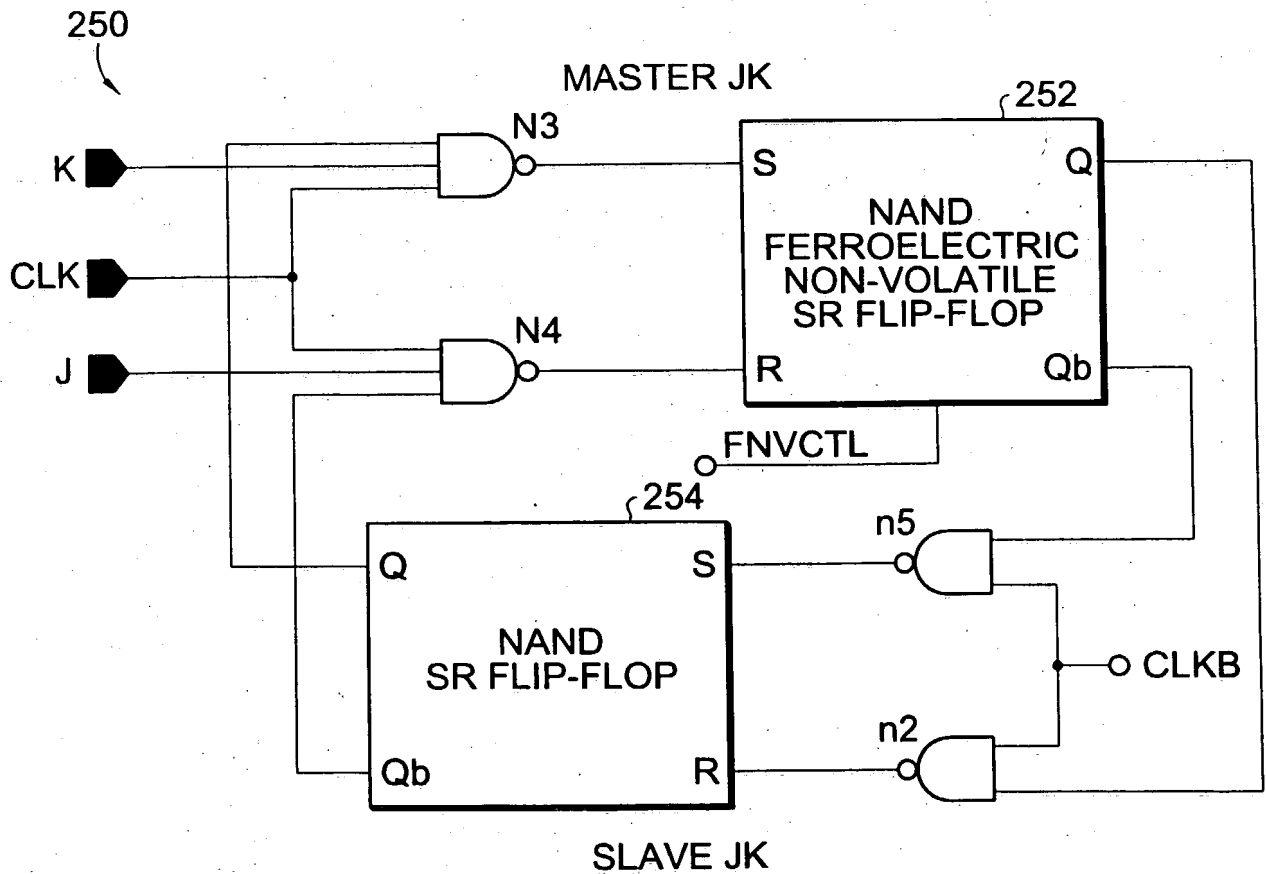
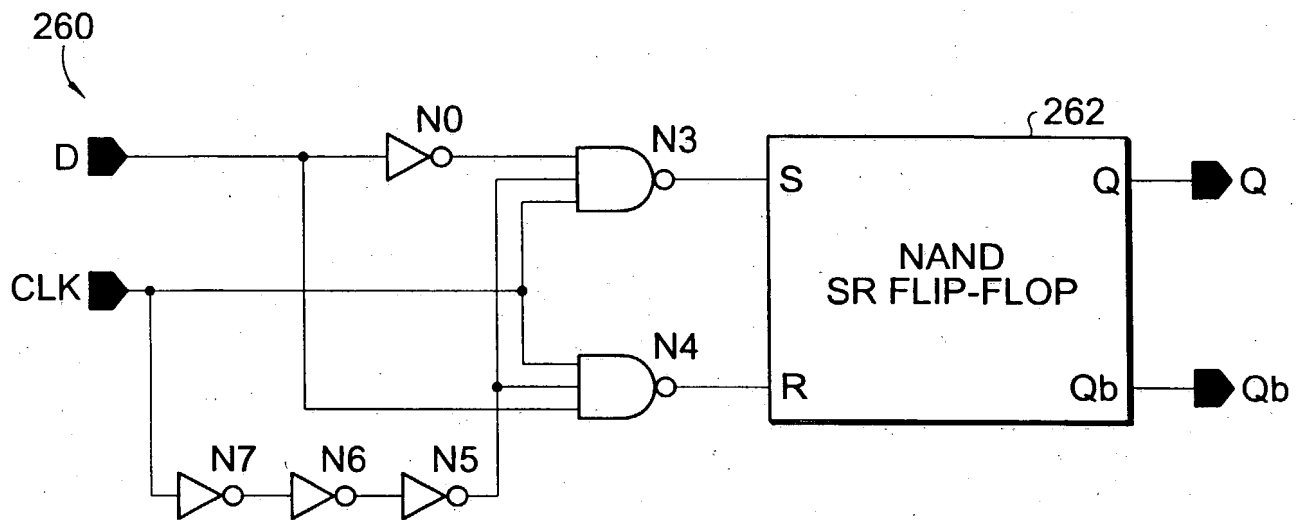
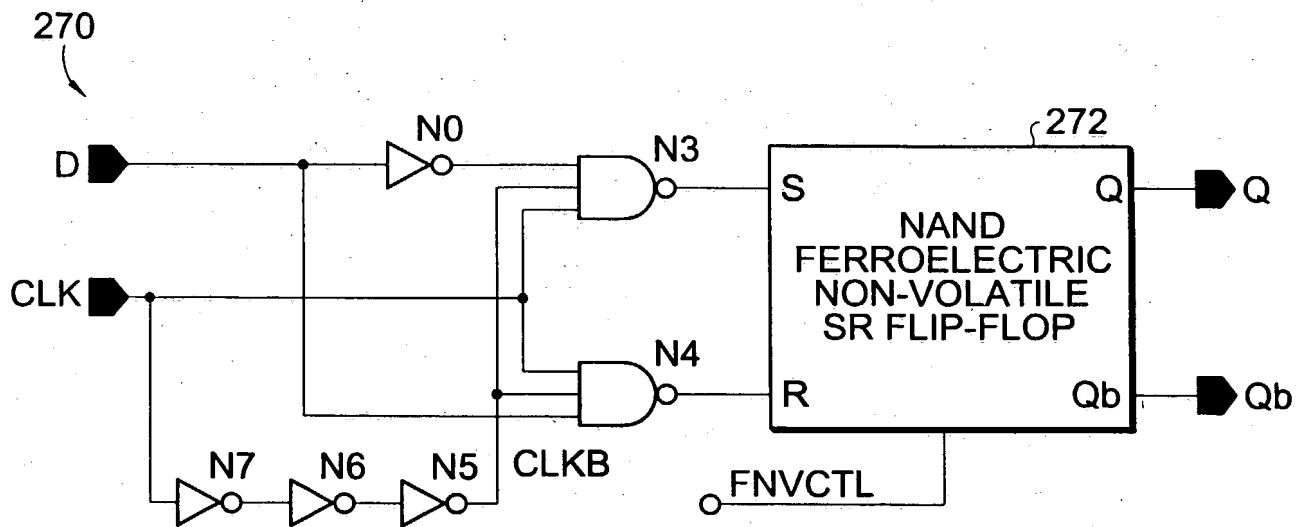


Fig. 23

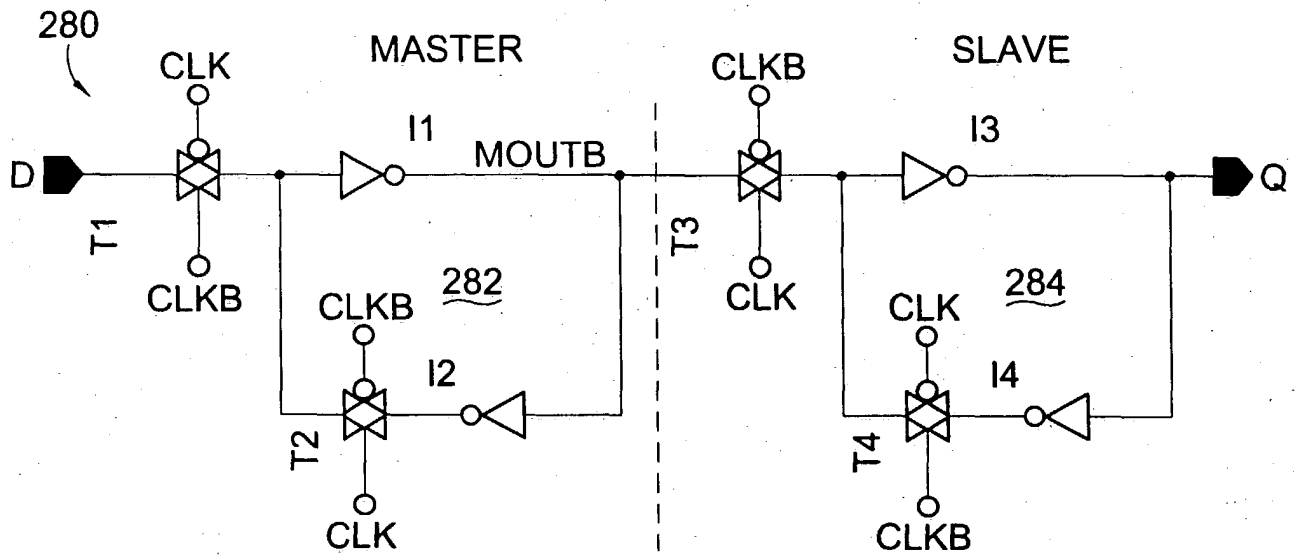
**Fig. 24****Fig. 25**



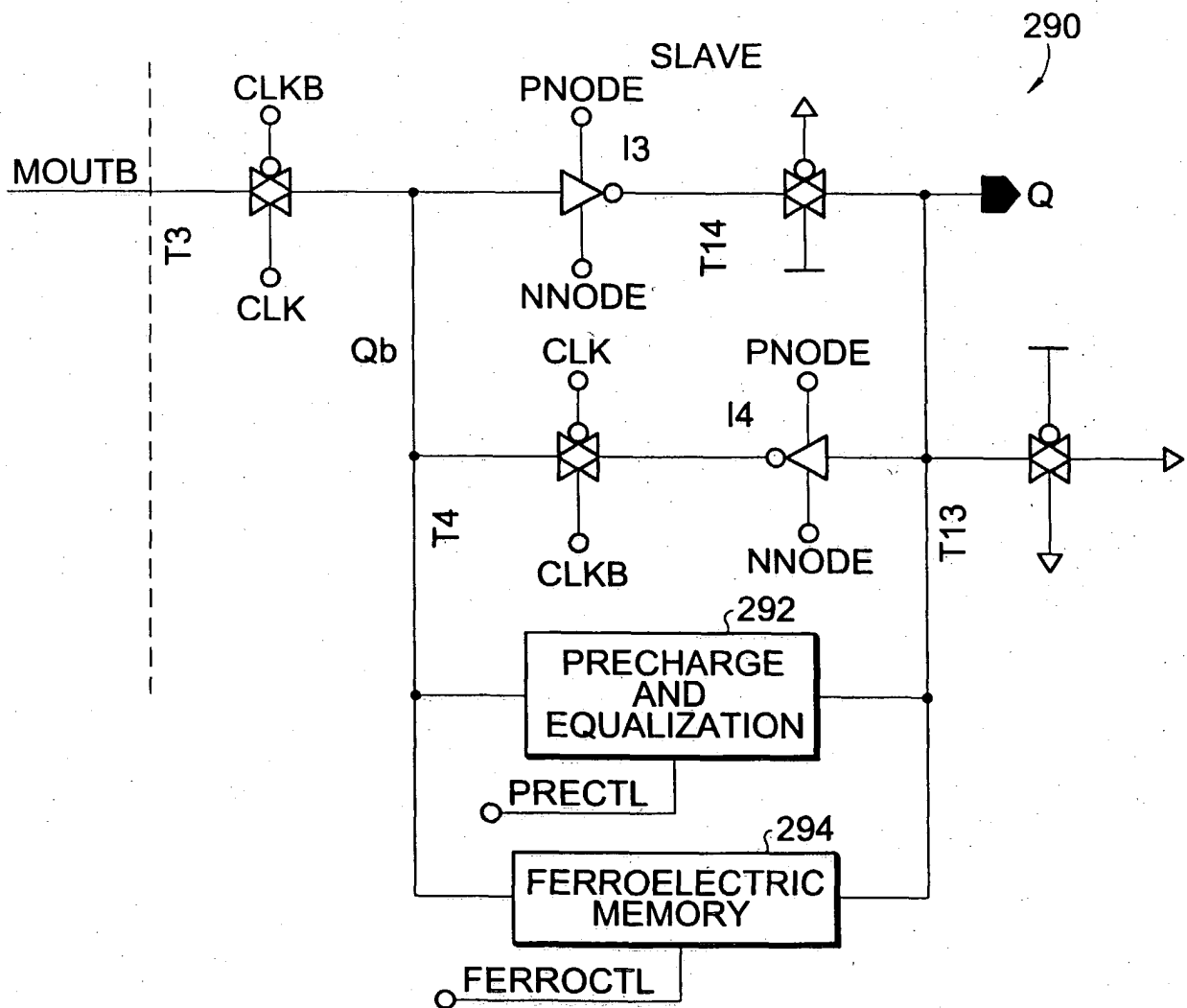
**Fig. 26**



**Fig. 27**

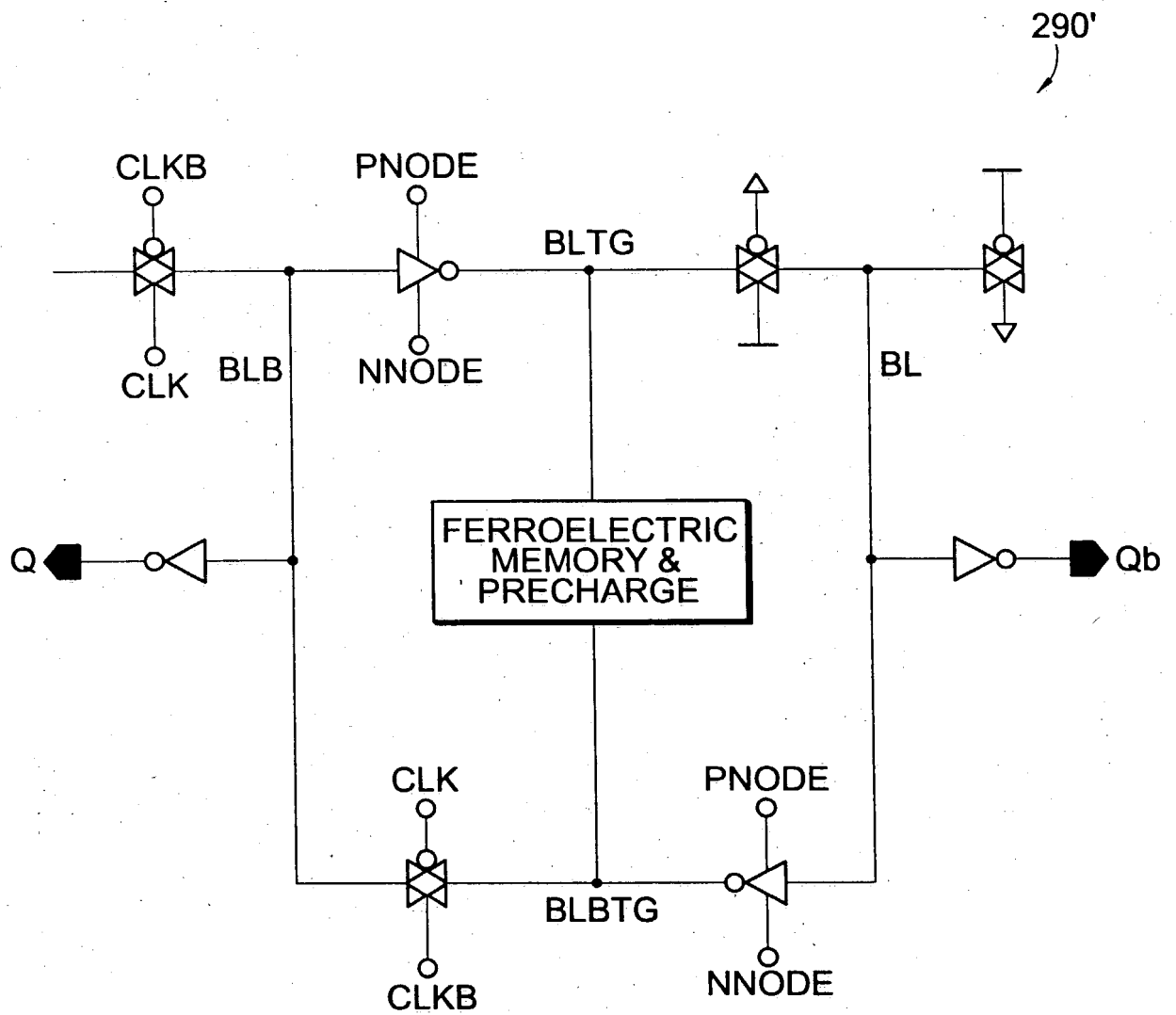


**Fig. 28**



**Fig. 29A**



**Fig. 29B**

# TRANSMISSION GATE BASED NON-VOLATILE D FLIP-FLOP POWER-UP TIMING NON-VOLATILE SLAVE

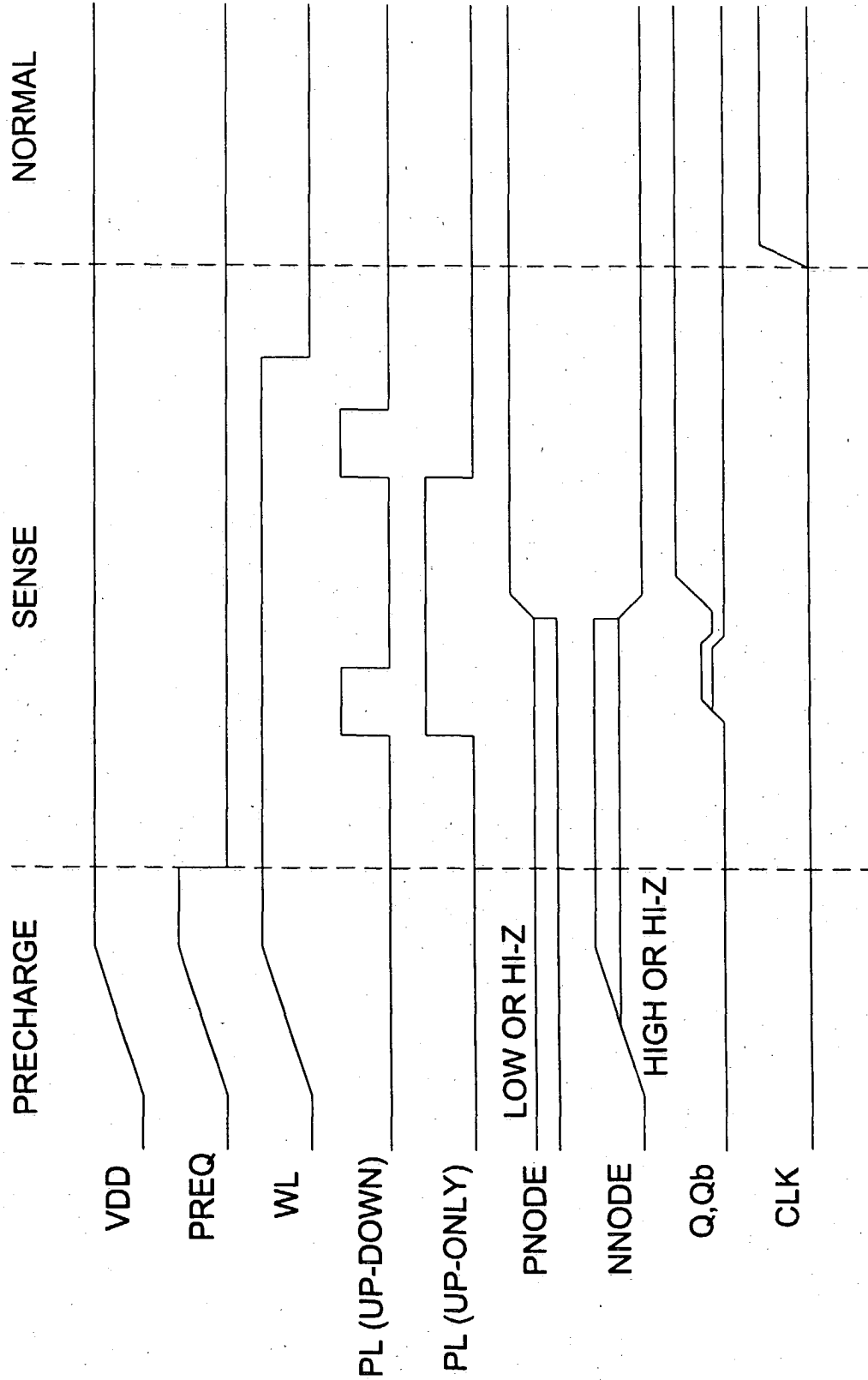


Fig. 30A

310

## TRANSMISSION GATE BASED NON-VOLATILE D FLIP-FLOP POWER-DOWN TIMING

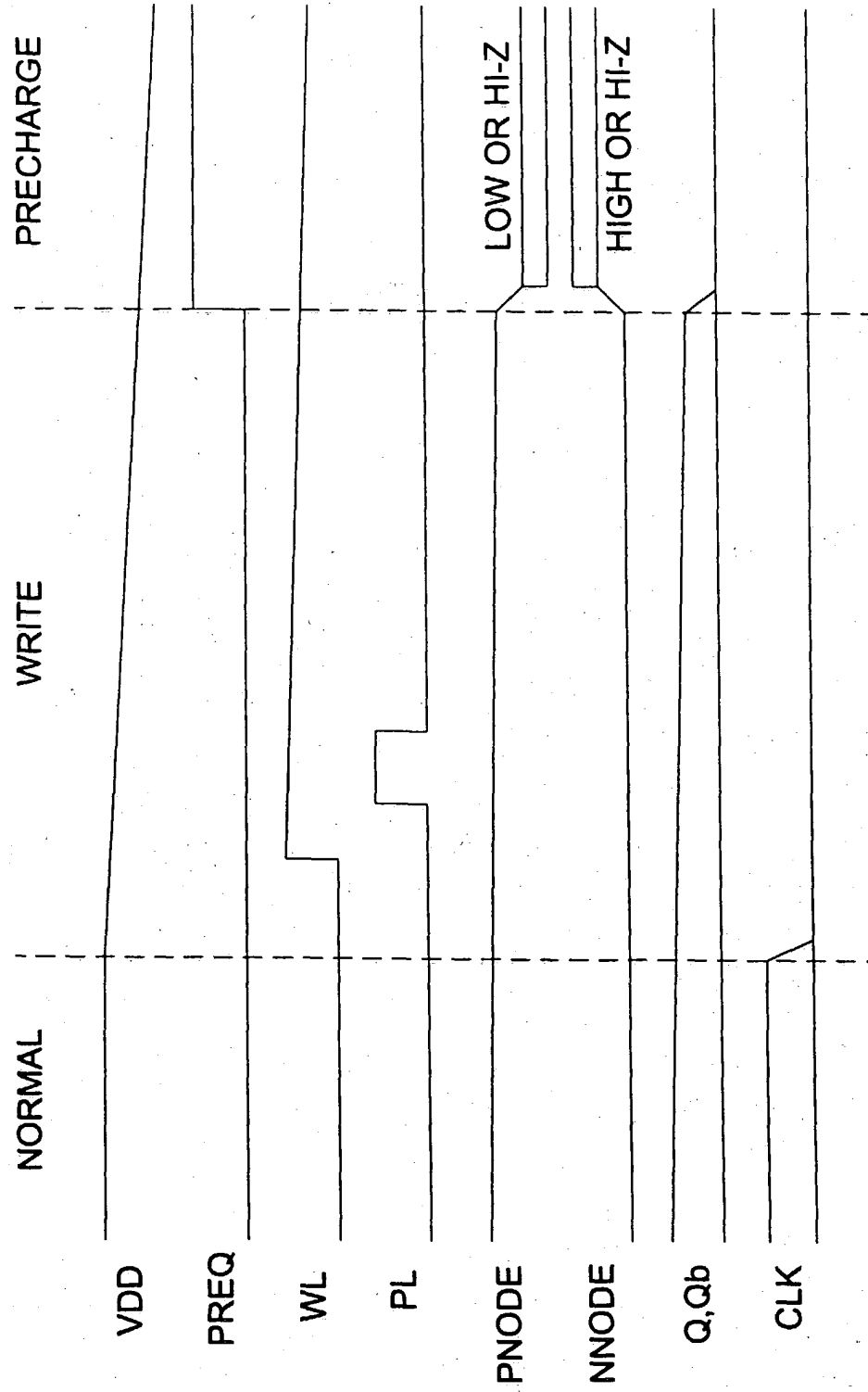


Fig. 31A

300' TRANSMISSION GATE BASED NON-VOLATILE D FLIP-FLOP POWER-UP TIMING  
NON-VOLATILE SLAVE

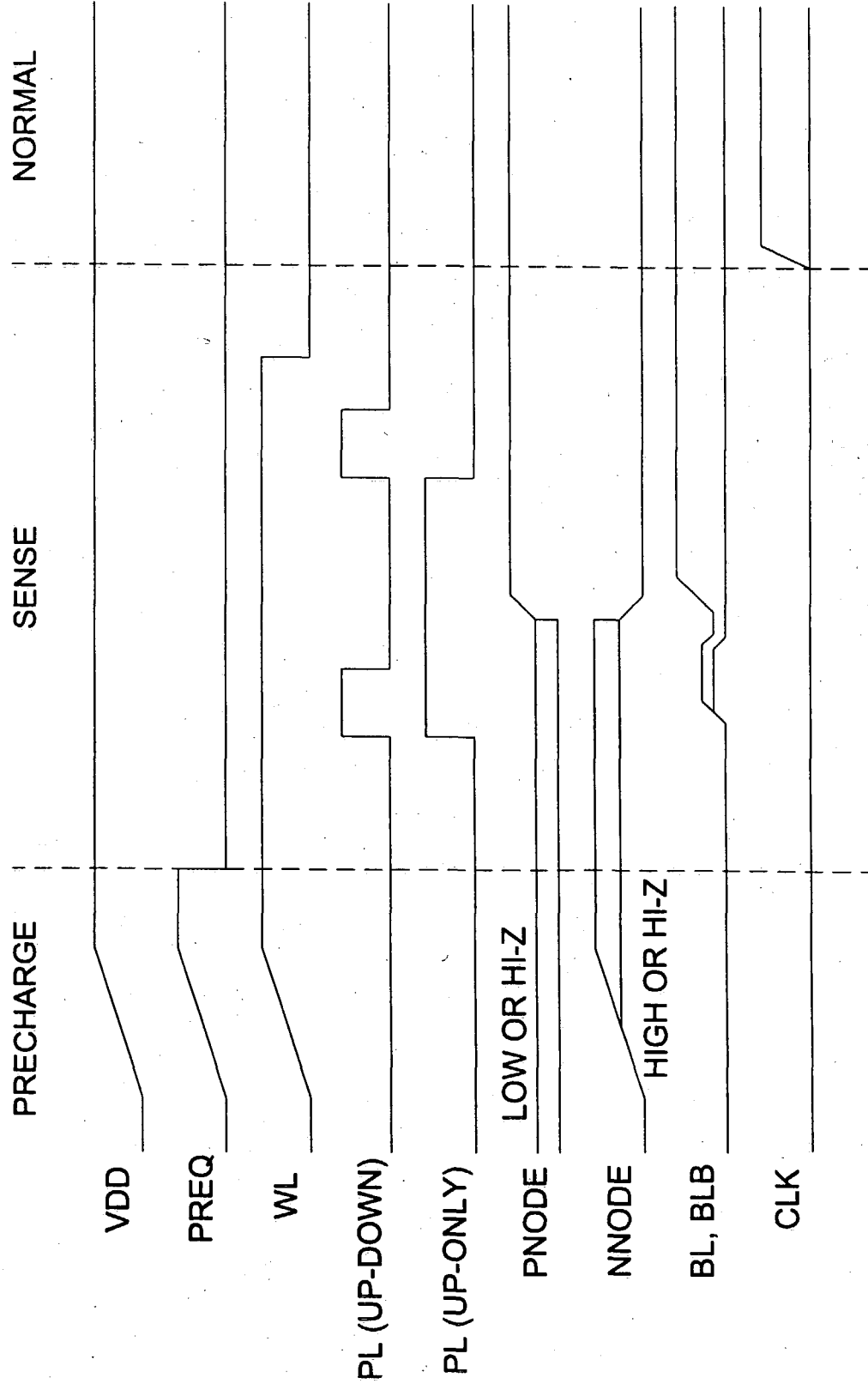


Fig. 30B

310'

## TRANSMISSION GATE BASED NON-VOLATILE D FLIP-FLOP POWER-DOWN TIMING

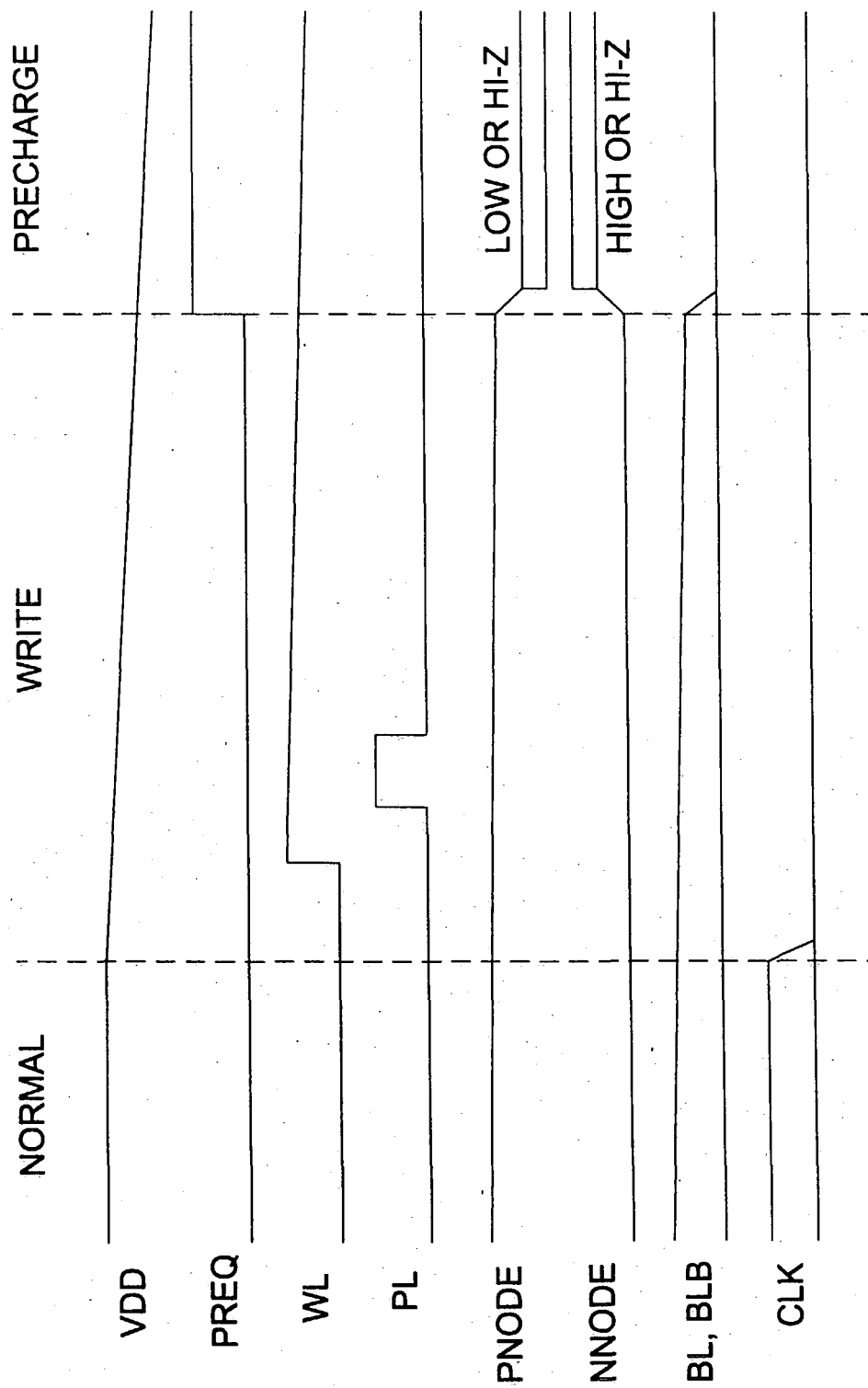


Fig. 31B

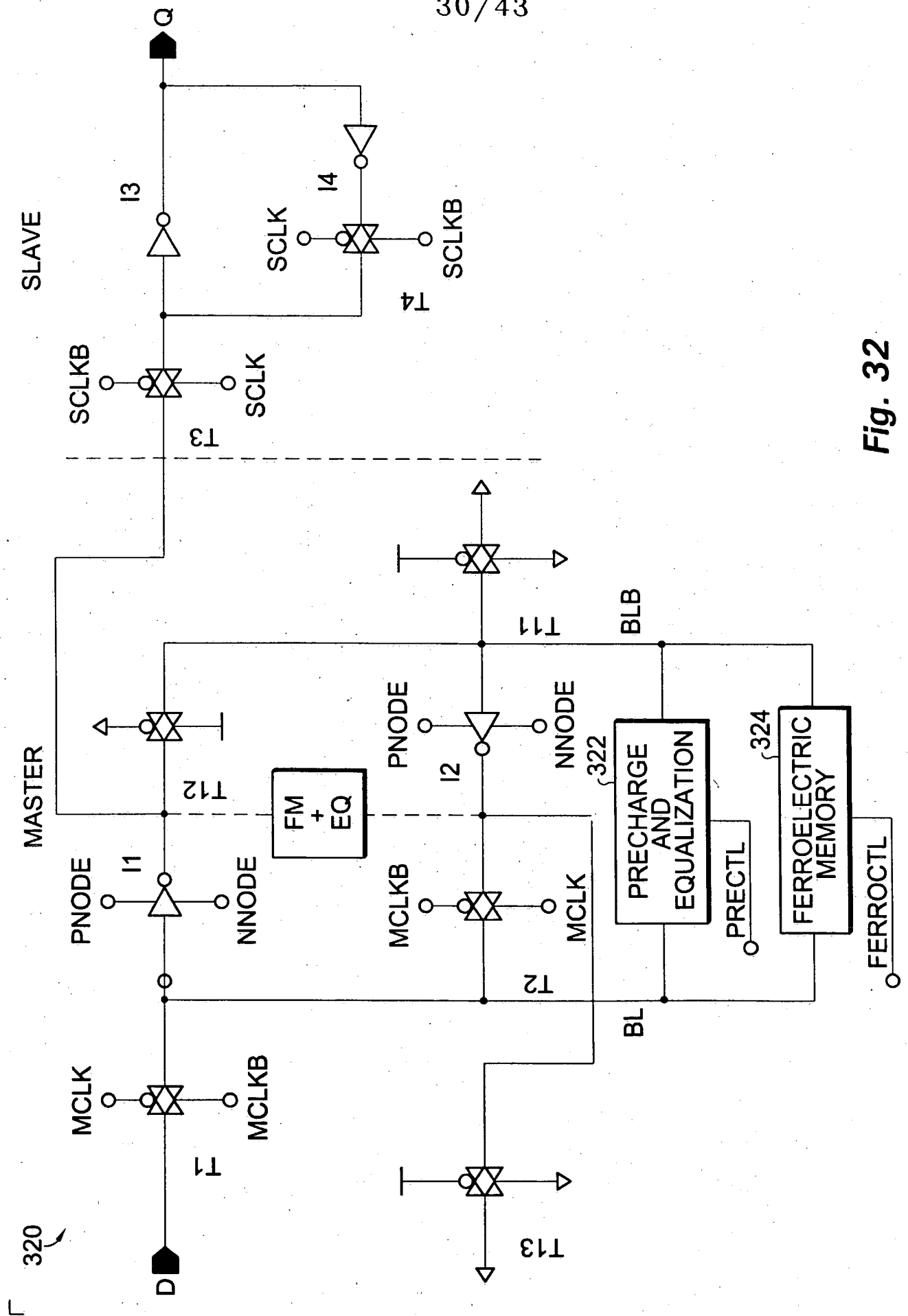


Fig. 32

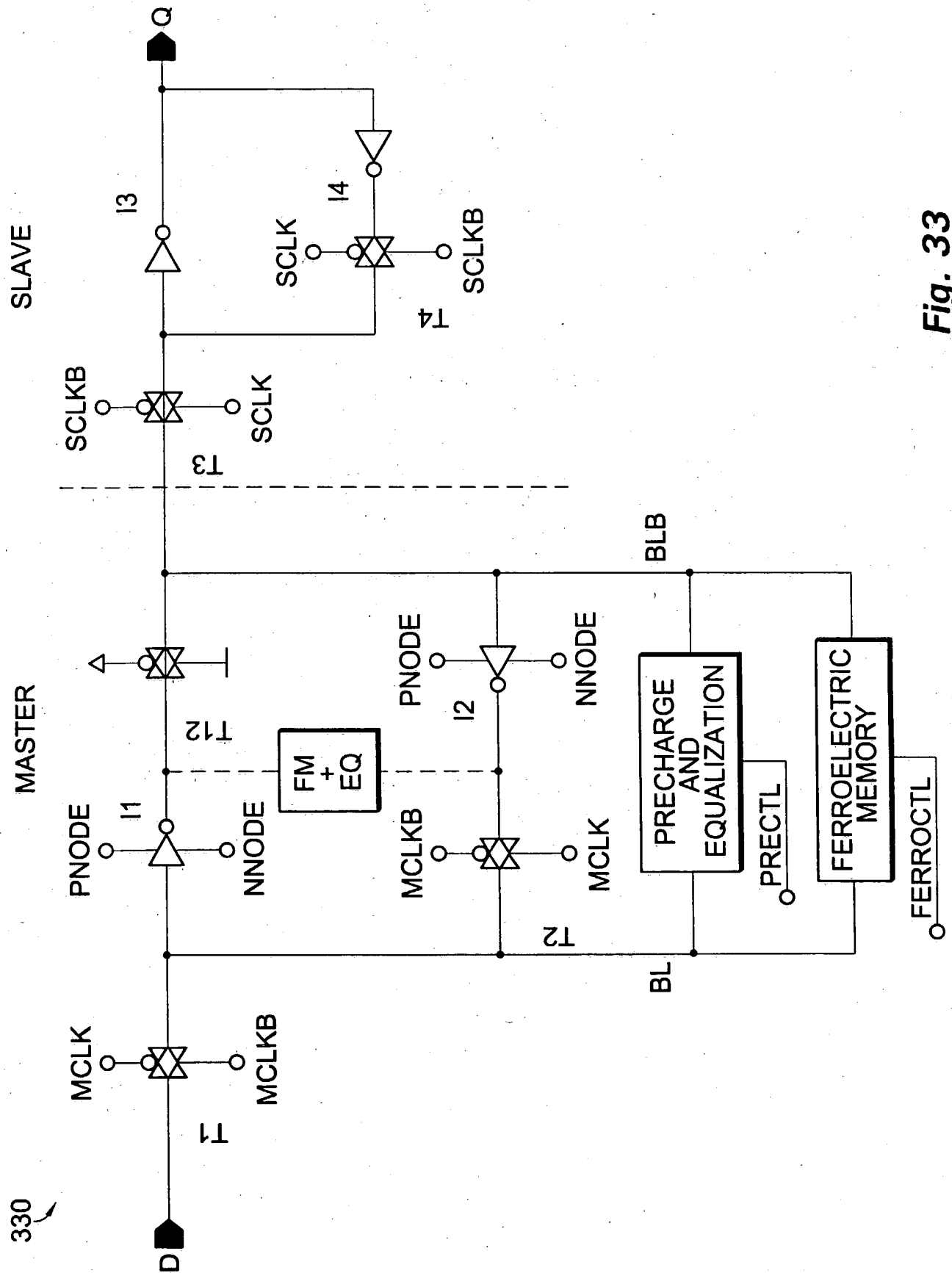


Fig. 33

# 340 TRANSMISSION GATE BASED NON-VOLATILE D FLIP-FLOP POWER-UP TIMING NON-VOLATILE MASTER

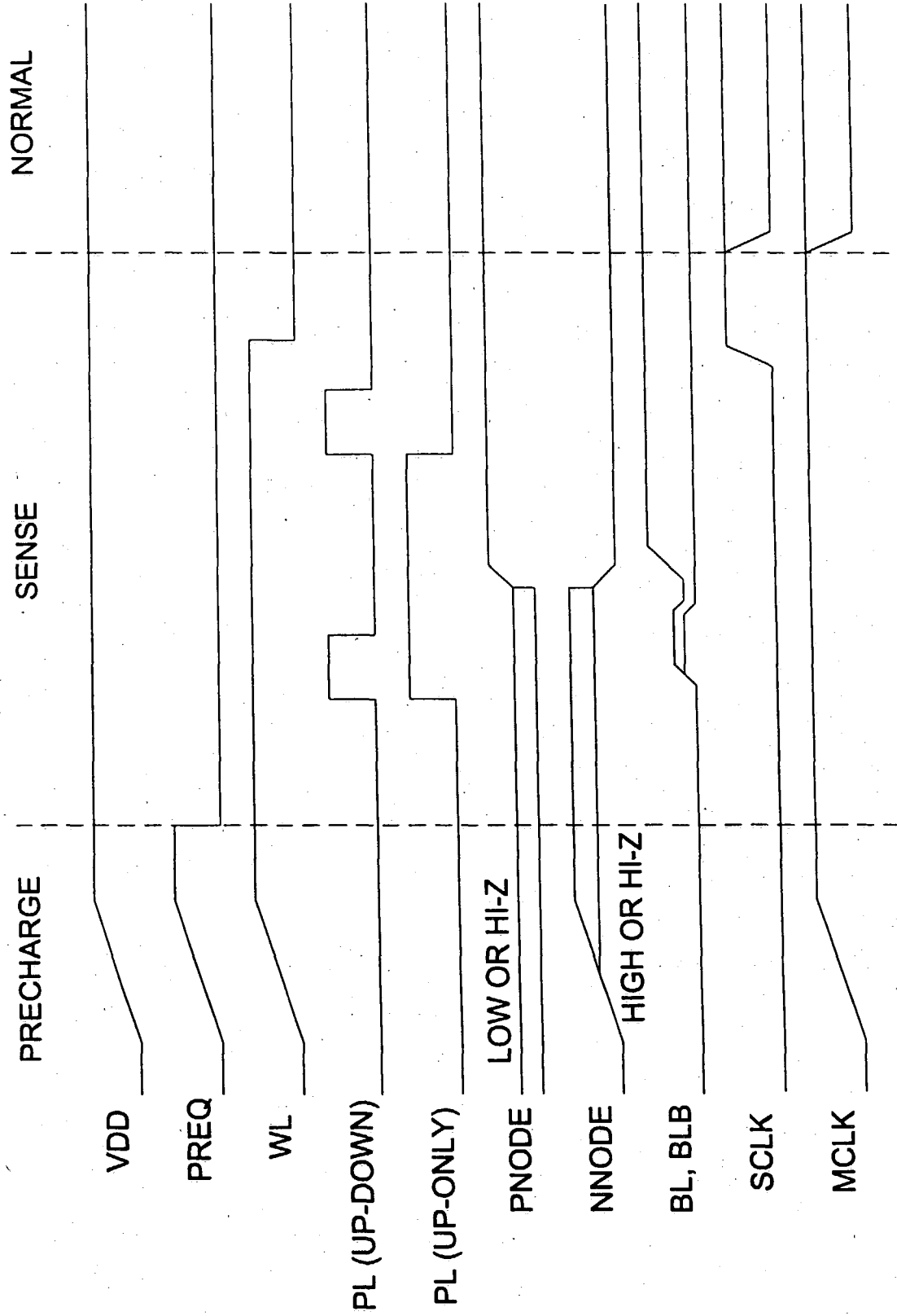
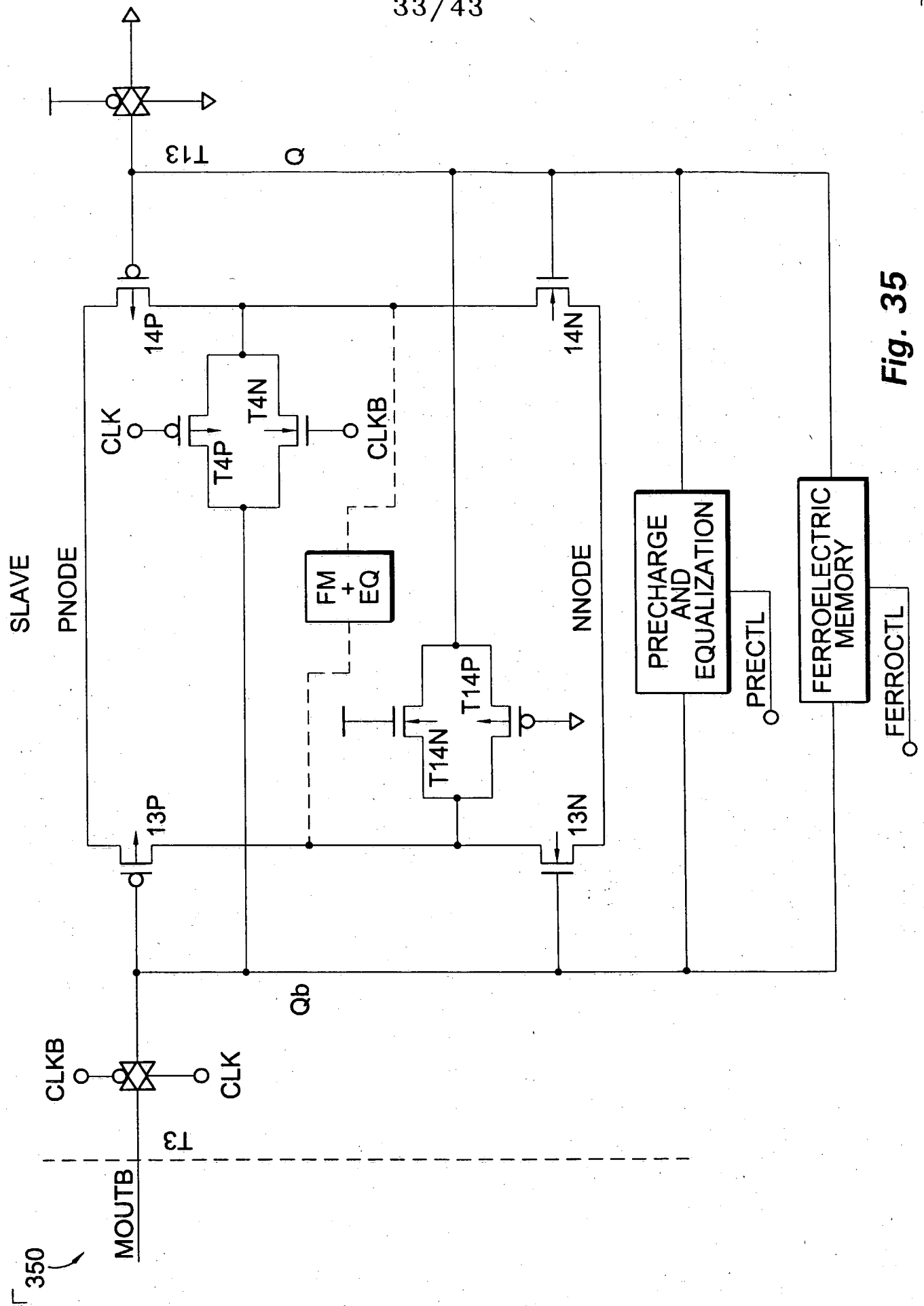


Fig. 34





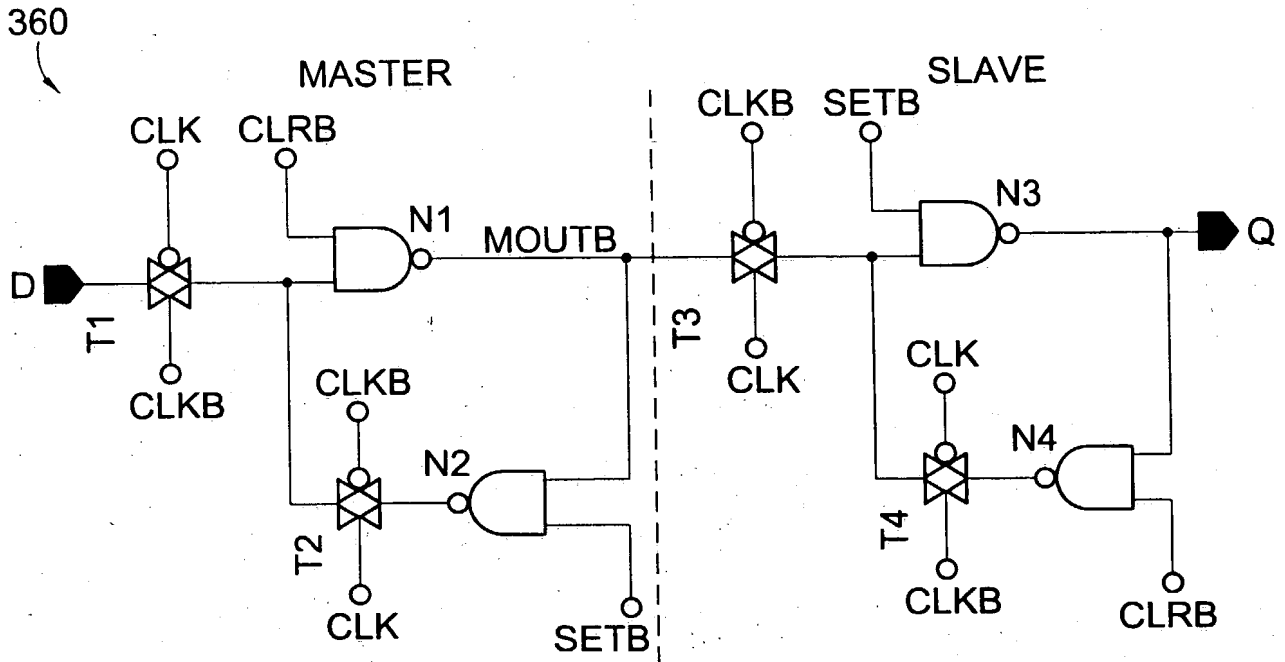
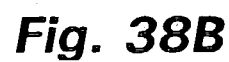
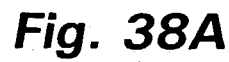


Fig. 36

370

CLK	SETB	CLRB	Q
X	0	0	1
X	0	1	1
X	1	0	0
X	1	1	QLAST
↑	1	1	D

Fig. 37





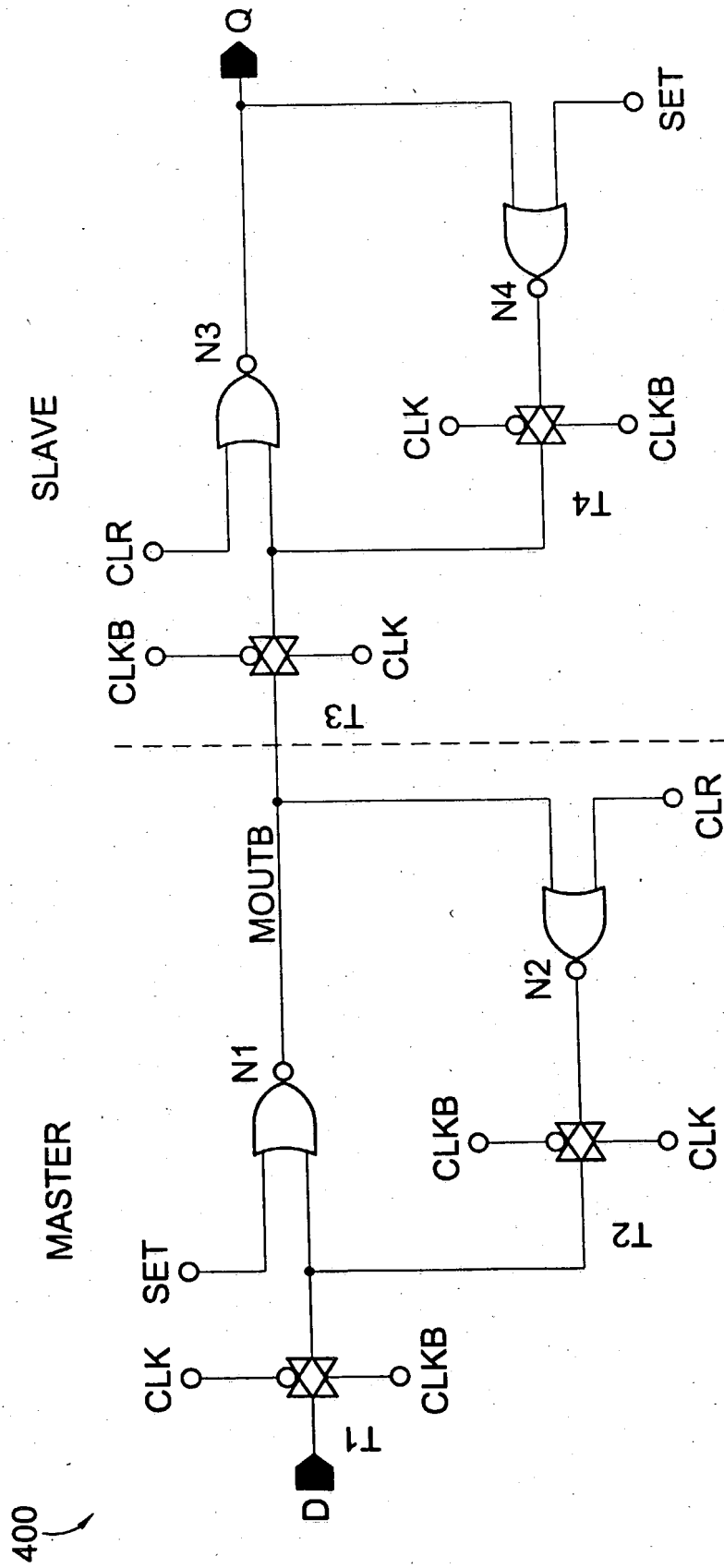


Fig. 40

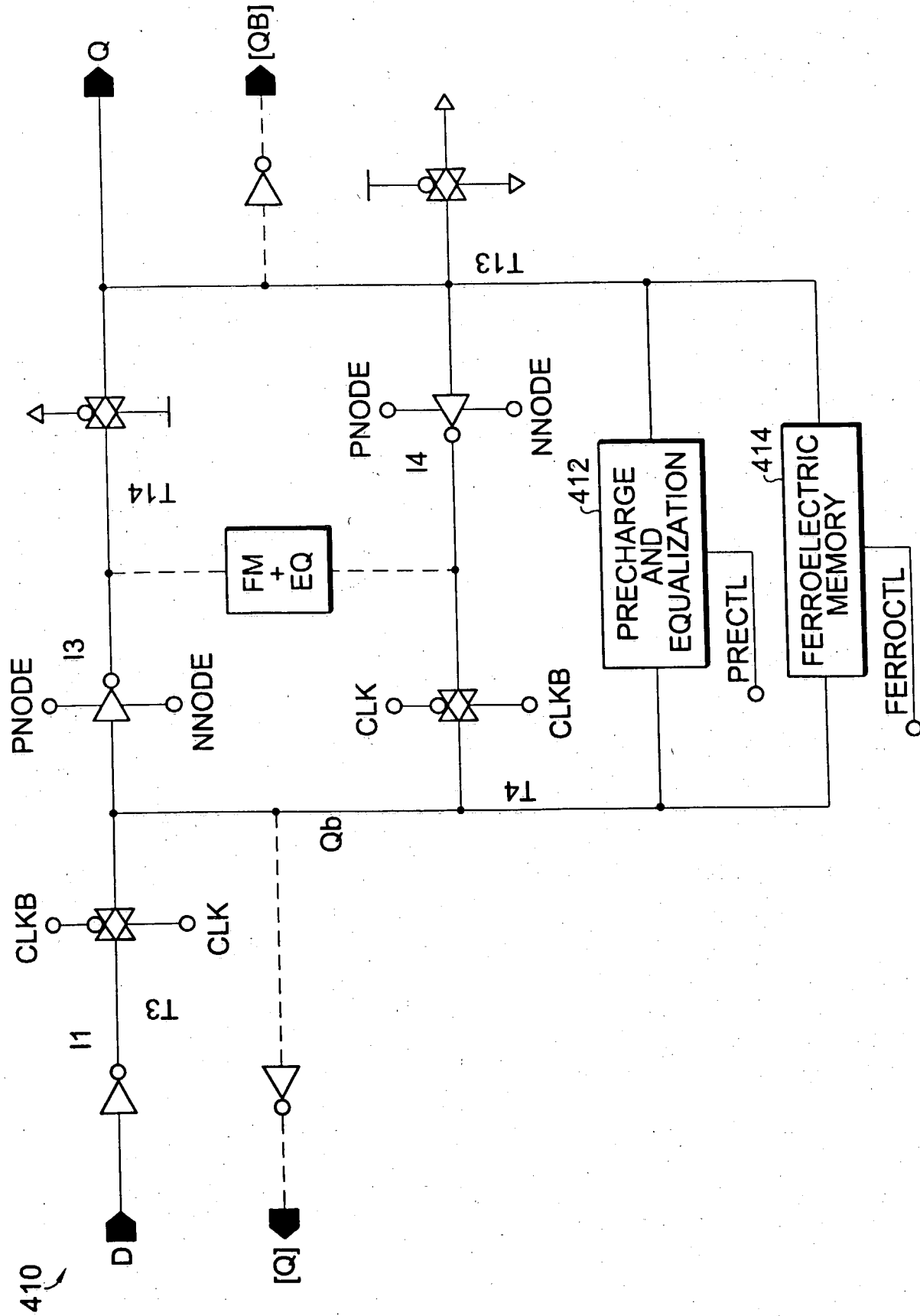


Fig. 41

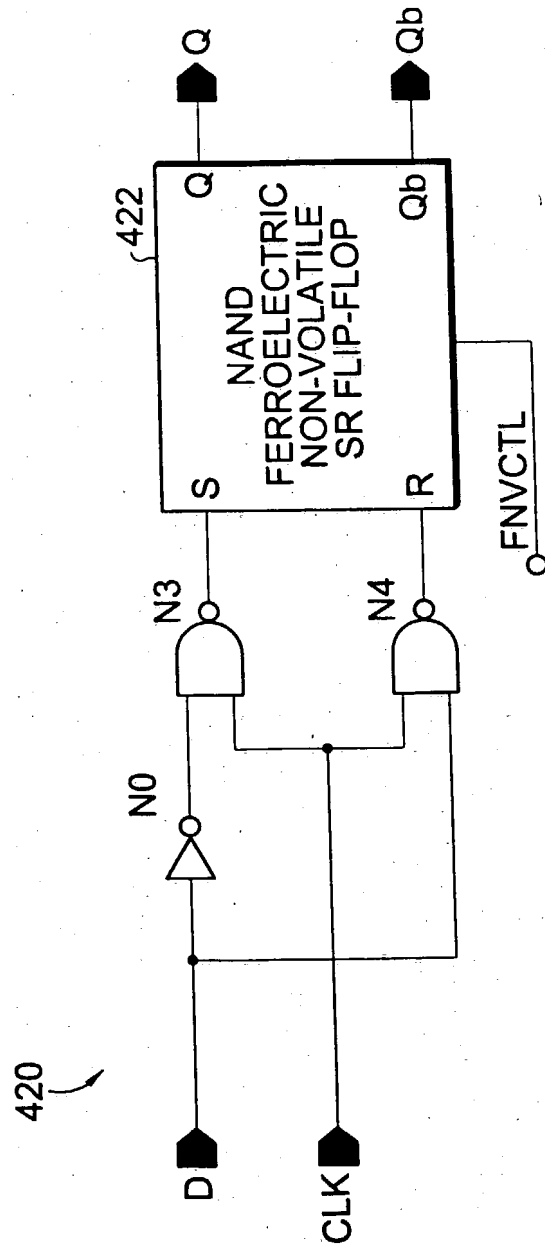


Fig. 42

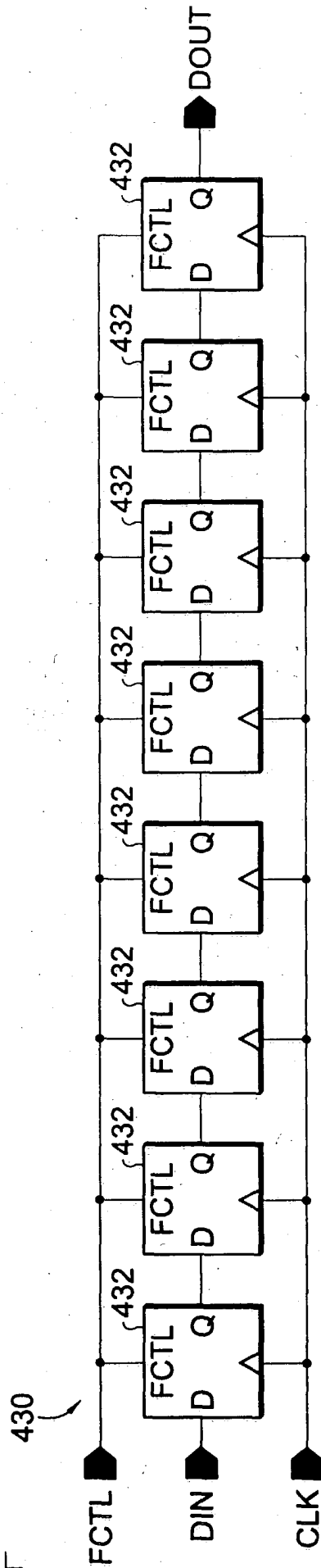


Fig. 43

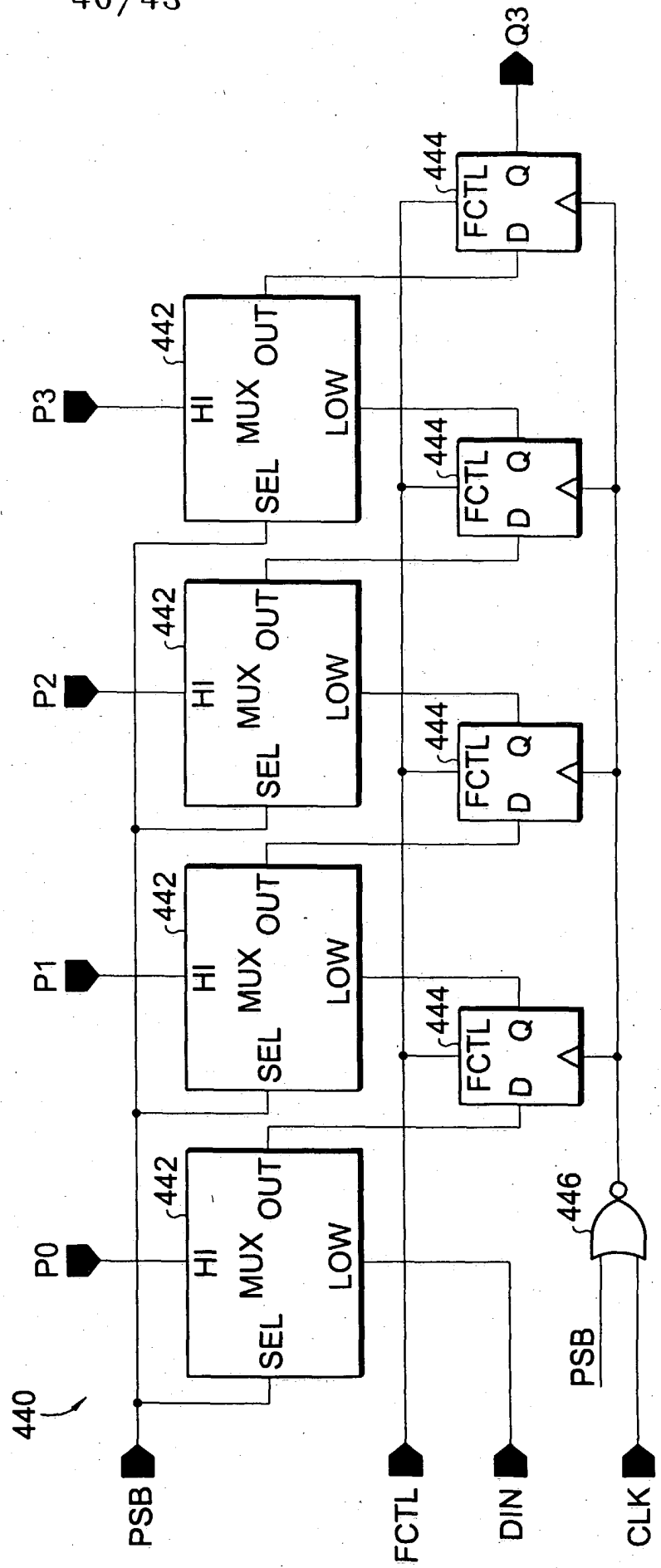


Fig. 44



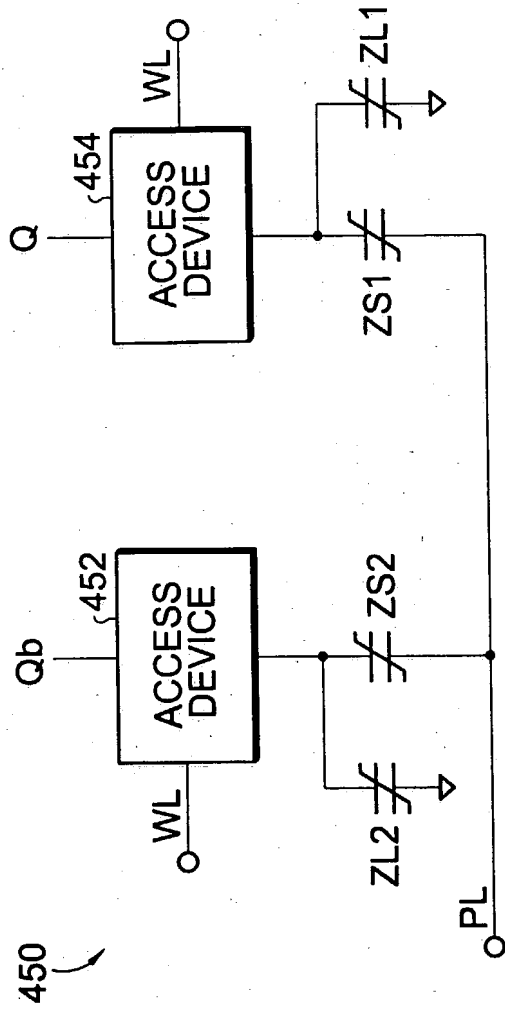


Fig. 45

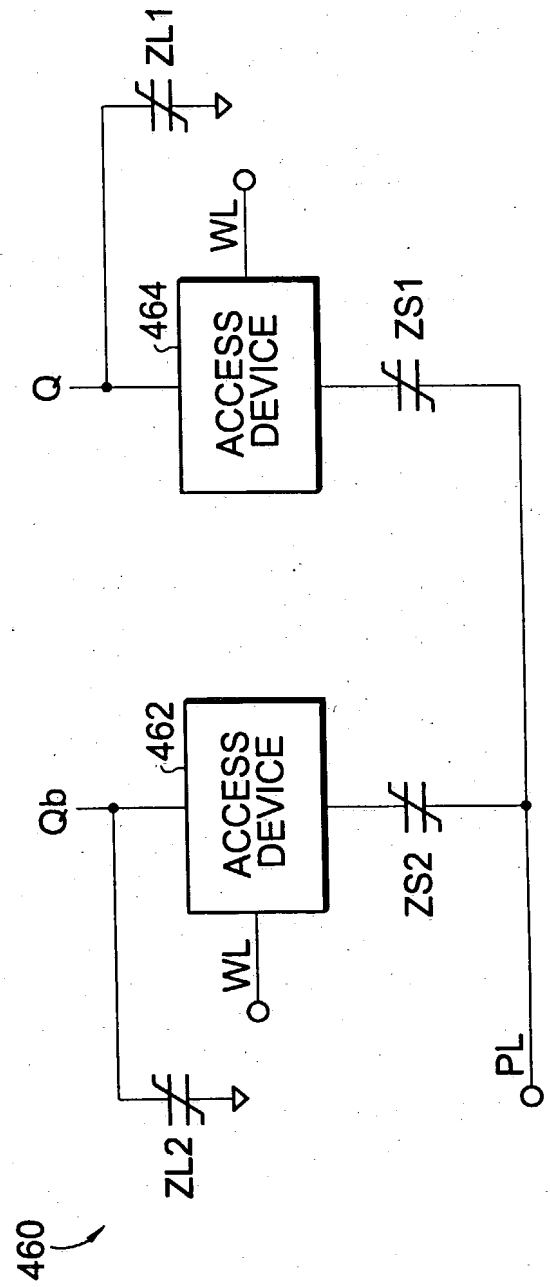


Fig. 46

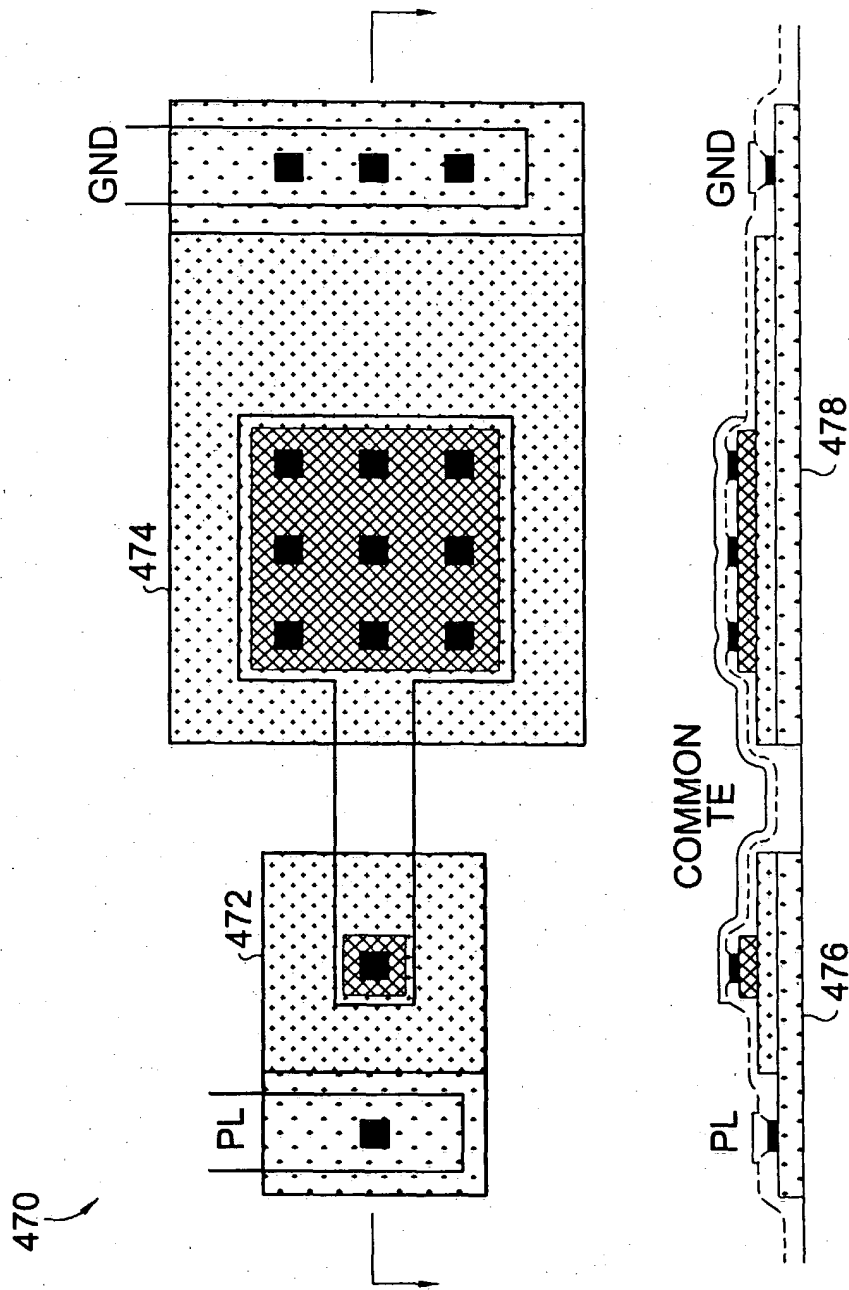


Fig. 47

- METAL
- CONTACT
- INTER-LAYER DIELECTRIC
- ▨ TOP ELECTRODE
- ▨ FERROELECTRIC
- ▨ BOTTOM ELECTRODE

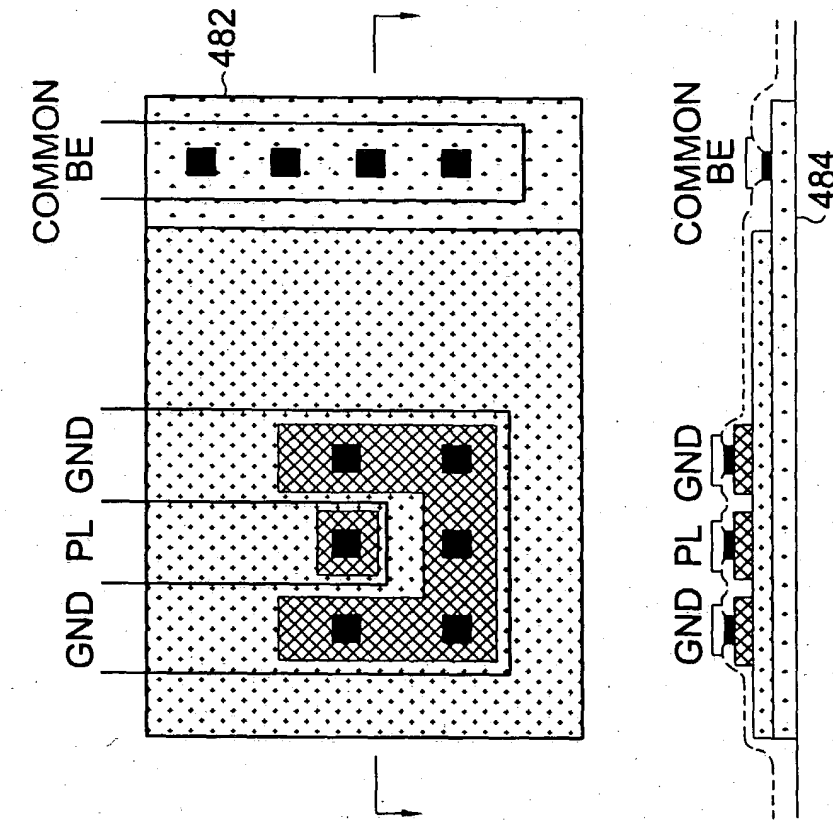


Fig. 48

- METAL
- CONTACT
- ▤ INTER-LAYER DIELECTRIC
- ▨ TOP ELECTRODE
- ▧ FERROELECTRIC
- ▦ BOTTOM ELECTRODE